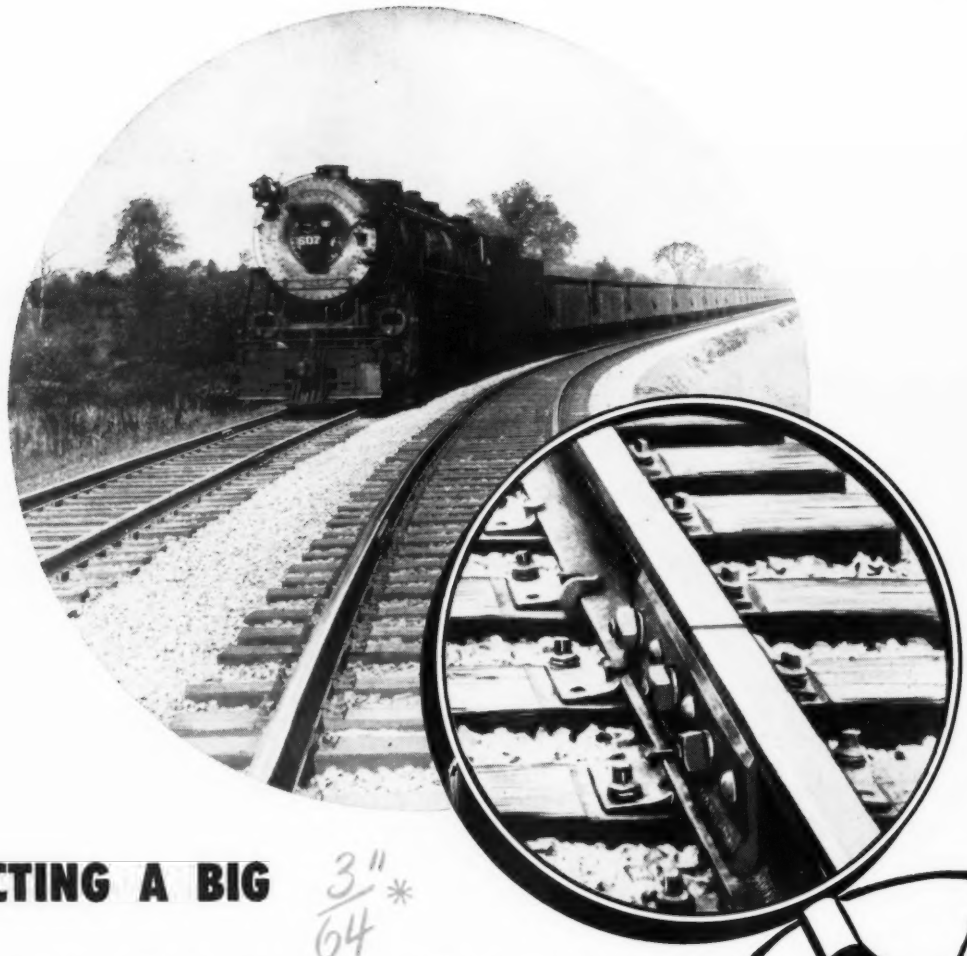


PROTECTING A BIG 3/64"*

TO CUT RAIL JOINT MAINTENANCE COST

* Experience has proven that when rail-end wear and batter reaches a depth of 3/64", it is noticeable in the riding quality of the track and that, from this point, if the condition is not corrected, deterioration of rail ends and joint structures is greatly accelerated.

Reliance Hy-Pressure Hy-Crome Spring Washers help to protect this vital 3/64" by keeping rail joint bolts *tighter longer* and postpone the necessity for costly rail-end conditioning and joint bar reforming and shimming. The inherent reactive pressure in Reliance Hy-Pressure Hy-Crome Spring Washers automatically compensates for dimensional changes in the rail joint assembly. This reduces the possibility of rail end batter and chipping, thus extending the period between maintenance operations and reducing costs.

Edgemark of Quality

Reliance **HY-PRESSURE HY-CROME** spring washers

EATON

EATON MANUFACTURING COMPANY

RELIANCE DIVISION
MASSILLON, OHIO

Sales Offices: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

Published monthly by Simmons-Boardman Publishing Corporation 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, $2.00 for one year; $3.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Marion, Ind., post office. Address communications to 79 W. Monroe St., Chicago 3, Ill. Volume 46. No. 1.

to stop "Soft-track"

Assure better stabilization at lower cost with the Texaco method of asphalt-cement pressure grouting

Here's the easiest, least expensive way to eliminate "water pockets" and give "soft track" longer-lasting stability. The Texaco method of asphalt-cement pressure grouting also reduces maintenance costs sharply. *Maintenance costs cut in half,* says one report. *Costs reduced by two-thirds,* says another.

To achieve comparable results, simply fortify your customary cement-and-sand grouting mixtures with small quantities of *Texaco No. 24 Emulsified Asphalt* — a superior asphalt developed especially for this purpose. It helps the grout flow more easily, assures better penetration and seal. It waterproofs the soil and stabilizes it without loss of resiliency.

Let a Texaco representative explain in detail this cost-saving method of track stabilization. Just call the nearest Railway Sales office listed below, or write The Texas Company, *Railway Sales Department,* 135 East 42nd Street, New York 17, N. Y.

2 More Ways to Reduce Track Maintenance Costs

1. Assure better drainage, cleaner track by coating stone ballast with *Texaco Asphalt.* Keeps track in line and on grade for years with minimum attention.

2. Keep rail joints from freezing, kinking, corroding, by using *Texaco Rail Joint Lubrication.* Applied under traffic and without taking down joints.

NEW YORK ★ CHICAGO ★ SAN FRANCISCO ★ ST. PAUL ★ ST. LOUIS ★ ATLANTA

TEXACO

TEXACO Emulsified Asphalt

FOR GROUTING

TUNE IN . . . TEXACO presents MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA radio broadcasts every Saturday afternoon.

YOUR NORTHWEST CANNOT BE SHUT DOWN *by control failure*

THERE must be no control failure on crane operations along the line. Your Northwest *cannot be shut down because of control failure.* On the Northwest, smooth, ease-of-operation is provided by the "Feather-Touch" Clutch Control, a simple drum device free from the complications of pumps, valves or refills.

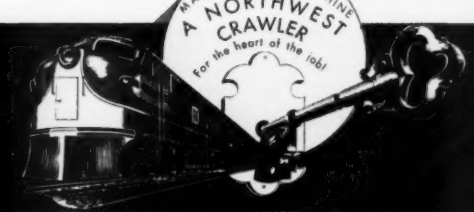
The "Feather-Touch" Clutch Control utilizes the power of the engine to throw heavy drum clutches. *Release is positive* and the operator does not have to hold the lever to keep the clutch engaged. Operation is in direct ratio to the pressure of the operator's hand. The *feel of the load* is always present. It is unaffected by the temperature, humidity or weather.

The "Feather-Touch" Clutch Control is another of the features that make the Northwest a railway man's unit. It means greater safety and dependability on the line.

Let us give you complete details on Northwest equipment, either crawler or truck mounted.

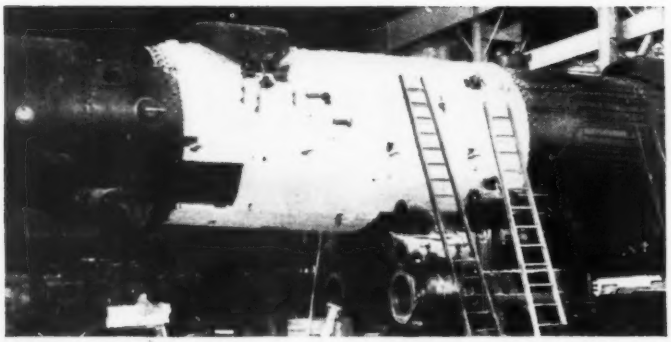
NORTHWEST ENGINEERING CO.
1513 Field Bldg.
135 South LaSalle Street, Chicago 3, Illinois

MAKE YOUR KEY MACHINE A NORTHWEST CRAWLER for the heart of the job!

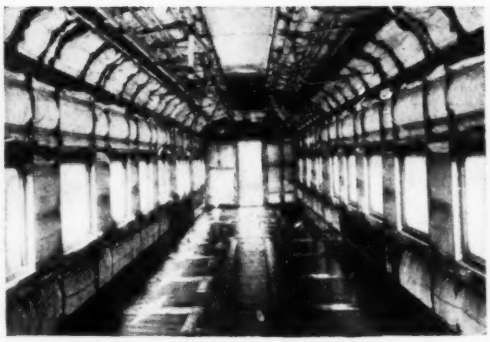


NORTHWEST

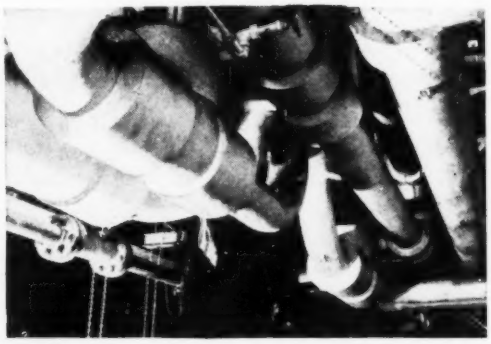
THE ALL PURPOSE RAILROAD MACHINE



To save on locomotive operation—Use J-M 85% Magnesia Locomotive Boiler Lagging. Combines high insulating value with light weight and the ability to retain its efficiency in service. Furnished in various thicknesses, curved or flat, straight or tapered, to permit snug fit to boiler surfaces.



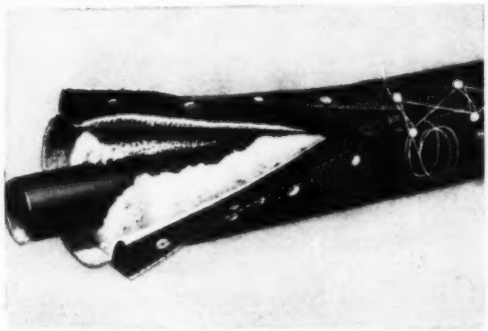
To save on passenger car operation—Insulate with J-M Stonefelt blankets for permanently high thermal insulation efficiency, lower air conditioning costs over the years. Stonefelt retains its rated thickness . . . won't settle with vibration. In addition, it is both fire- and moisture-resistant.



To save on power plant operation—Use 85% Magnesia, the most widely used insulation for steam lines up to 600° F. Light in weight, uniform in composition, it keeps fuel costs low, provides dependable insulation that often outlasts the installation.

...there is a type for every railroad requirement...

Johns-Manville manufactures many types of insulations for railroad use...for refrigeration cars, cold-storage rooms, tank cars, air-conditioning systems, locomotive fire-boxes, soundproofing. In addition, the completely equipped Johns-Manville Insulation Laboratories are available to help you find answers to new insulation problems. For further details, write Johns-Manville, Box 290, New York 16, N. Y.



To save on train operation—Use J-M Train-Line Insulations for steam piping, and hot and cold water and air-conditioning lines. Made of materials that maintain high efficiency under severe conditions of moisture and vibration and temperatures up to 450°F.

Johns-Manville

91 YEARS OF SERVICE TO TRANSPORTATION

NOW

A CLEAN, EFFECTIVE WOOD PRESERVATIVE FOR CAR LUMBER!

penta-chlorophenol

THE CLEAN WOOD PRESERVATIVE

Now that PENTAchlorophenol is available you should protect car lumber as well as ties.

PENTA, already popular with the utilities for the clean, effective protection it gives poles and crossarms, offers a real service to the railroads. Car lumber, decking, wood platforms, poles, all need the dependable protection PENTA gives. PENTA does not leach out even under severest moisture conditions. It protects against termites and decay *through the years.*

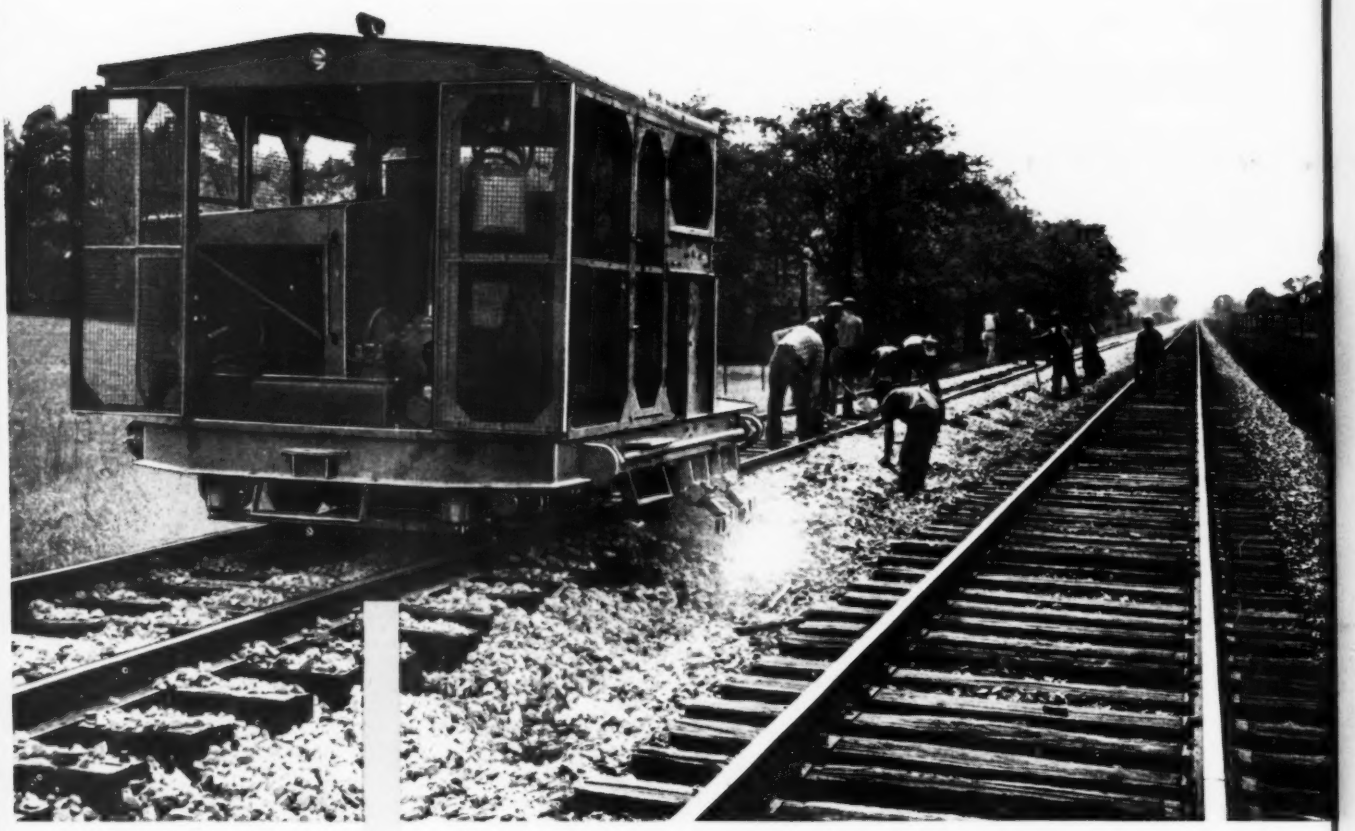
When cleanliness and reliability really count, specify "PENTA". For further information write Dow. Dept. PE 4.

PENTA protects ties!
Protect newly adzed tie surfaces with PENTA. Economical and easy to use, even in coldest weather.

DOW
penta-chlorophenol

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

With This Machine



Ballast-tamping labor costs were cut:

71% by Railroad X

68% by Railroad Y

53% by Railroad Z

● The railroad names may be fictional—*but the figures are facts.* They show actual labor-cost savings reported by three important lines—on-the-job economies delivered by Pullman-Standard *Power Track Ballasters,* as against tamping with power hand tools.

With Railroad X the hand-tamping cost per mile was $1,470.00 and the machine-tamping cost *only* $422.40—a saving of 71%. With Railroad Y the cost dropped from $1,214.00 per mile to $380.00—a saving of 68%. And with Railroad Z, the difference between $1,806.23 and $842.45 meant a saving of 53%.

In no case were these Pullman-Standard Power Track Ballasters equipped with automatic ballast feed—a recent development for *still* greater economy. Also, these case histories antedate the 40-hour week. Today the "spread" is wider than ever!

You are invited to seek more detailed information about the Pullman-Standard Power Track Ballaster and its teammates—the Cribber and the Ballast Cleaner. These *three* machines, working in production-line sequence, bring *compounded* savings.

WRITE for a copy of "Track at Its Level Best"—a data-file brochure describing and picturing *all* the Pullman-Standard power track maintenance machines.

Pullman-Standard

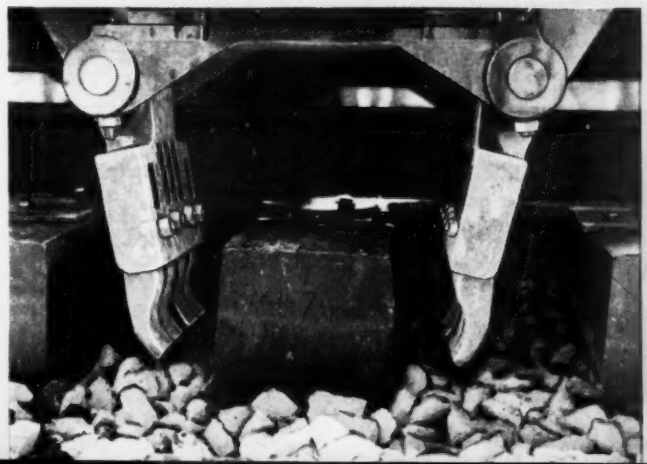
CAR MANUFACTURING COMPANY

POWER BALLASTER DIVISION

79 East Adams Street, Chicago 3, Illinois

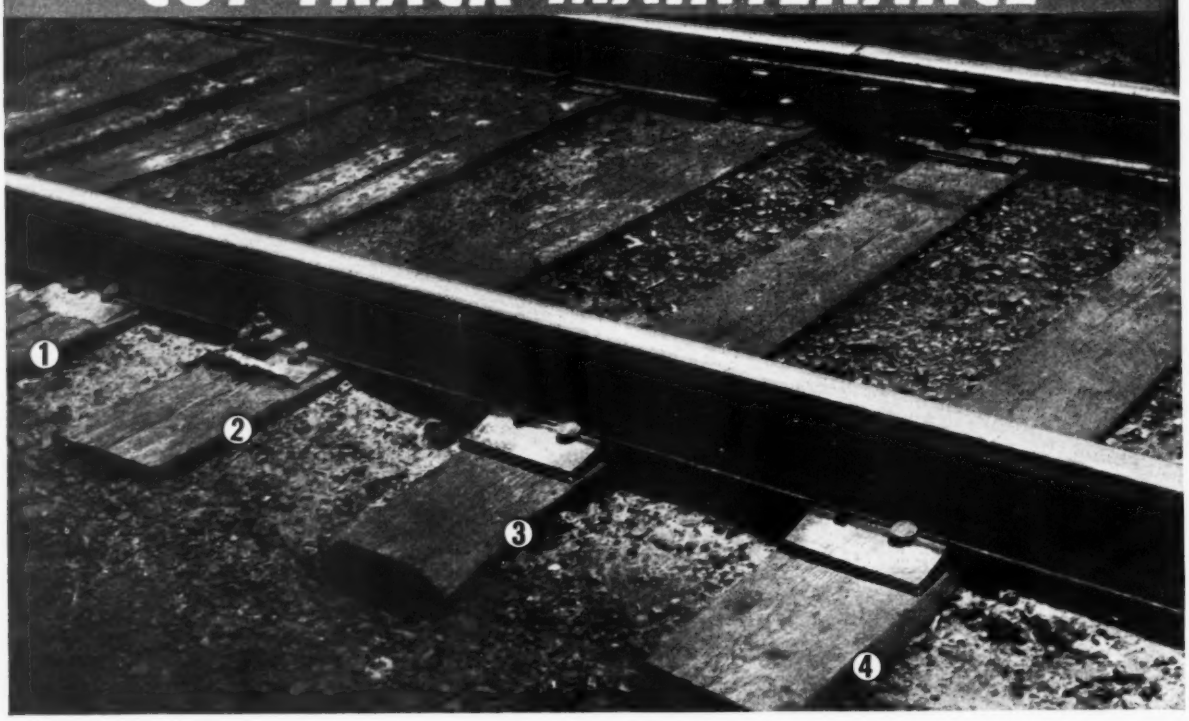
BIRMINGHAM 3, 1004 First National Building • CLEVELAND 15, 907 Midland Building • PITTSBURGH 19, 1115 Gulf Building
NEW YORK 17, 52 Vanderbilt Avenue • WASHINGTON 6, D. C., 1025 Connecticut Avenue, N.W.
SAN FRANCISCO SALES REPRESENTATIVE: MARK NOBLE

Close-up of Ballaster tamping outside the rail. Pressure is directed downward and inward. Tamping is firmer and more uniform than hand tamping, and lasts longer.



The Ballaster is equipped with power-operated lifting jacks and power-driven transverse wheels, for complete setoff in from three to five minutes. The machine travels to and from the job at 25 miles per hour.

FABCO TIE PADS CUT TRACK MAINTENANCE



These ties clearly illustrate the advantages of using FABCO Tie Pads. Ties number 1, 2, 3 and 4 were installed at the same time in a busy railroad terminal on a 14 degree curve. This section of track has as high as 200 train movements a day, with a great deal of starting and stopping and heavy use of sand. Ties number 3 and 4 were protected with FABCO Tie Pads, whereas Ties number 1 and 2 were not. Note that the plates on ties number 1 and 2 have buried themselves below the level of the tie surface, whereas ties number 3 and 4 show no damage from plate cutting.

Further Information Furnished on Request

FABREEKA PRODUCTS COMPANY
INCORPORATED
222M SUMMER STREET, BOSTON 10, MASSACHUSETTS
NEW YORK CHICAGO DETROIT PHILADELPHIA
SPARTANBURG, S. C. OAKLAND, CALIF.

Champion OF 'EM ALL

Far in front of the field—the International TD-24 is unchallenged "Champion" of off-the-track power. Check its unmatched features that deliver unequaled production.

PLANET POWER DRIVE to give you power on both tracks in a turn *plus* an *instant shift* up or down one speed, without de-clutching.

HYDRAULIC STEERING CONTROL for effortless ease of operation and matchless maneuverability.

SYNCHROMESH TRANSMISSION for on-the-go speed change eliminating waste shifting time.

EIGHT SPEEDS forward or reverse to match the speed exactly to the job phase.

140 DRAWBAR HORSEPOWER — more pulling and pushing power than has ever before been available in a crawler.

No other crawler has *any* of these features.

Let your International Industrial Power Distributor demonstrate the TD-24 and you'll see why it's the "Champion of 'em all."

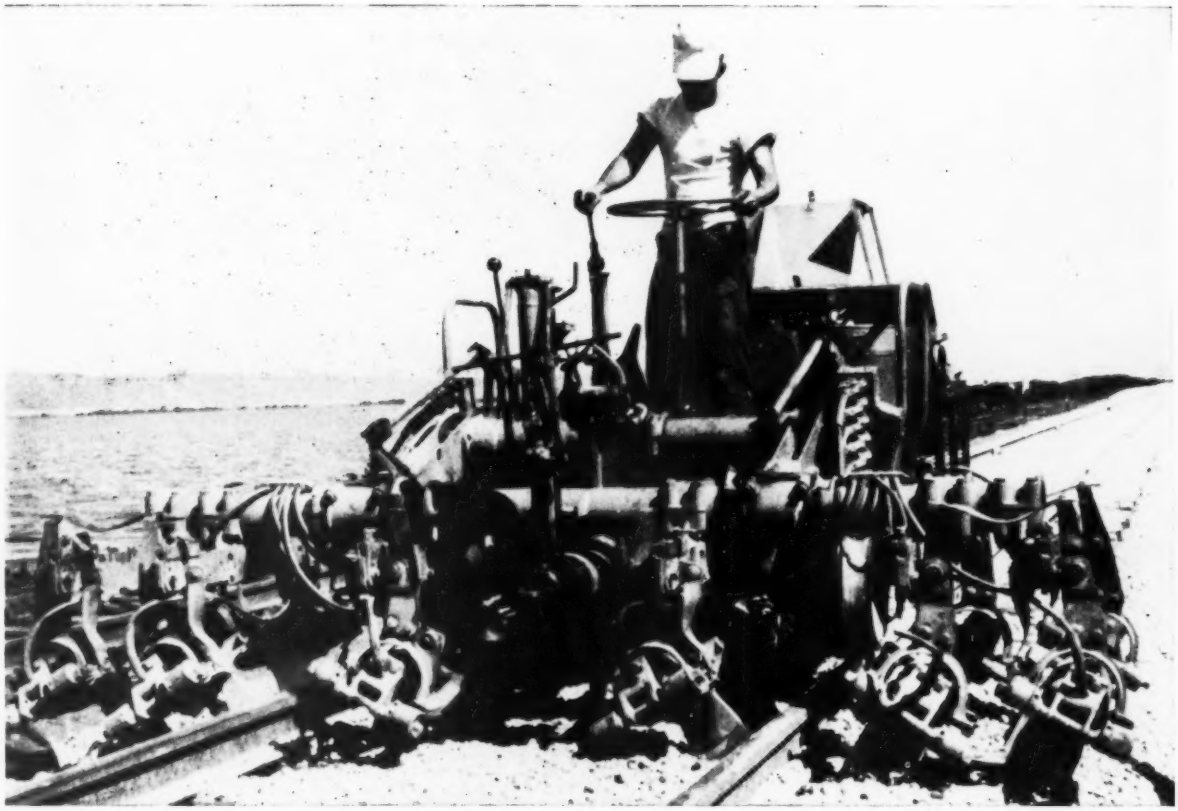
INTERNATIONAL HARVESTER COMPANY • Chicago

INTERNATIONAL HARVESTER

CRAWLER TRACTORS
WHEEL TRACTORS
DIESEL ENGINES
POWER UNITS

INTERNATIONAL INDUSTRIAL POWER

Standardize on Power that Pays



JACKSON *multiple Tamper*

IMPORTANT IMPROVEMENTS IN THE 1950 MODEL

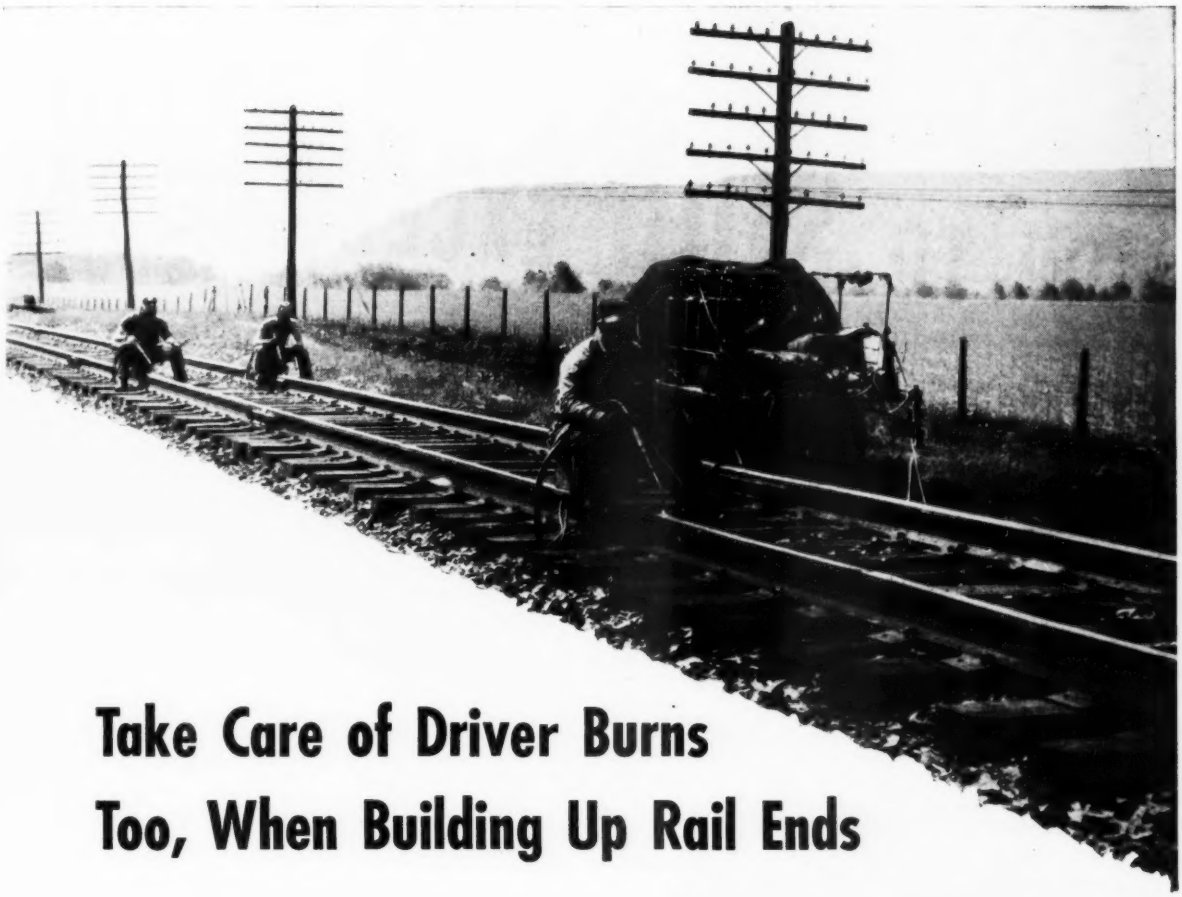
WILL FURTHER INTRENCH THIS MACHINE AS THE BEST MEDIUM OF PUTTING UP FINEST TRACK AT THE LOWEST COST PER MILE!

These improvements are the result of three years of careful observation of operations in the field and are indicative of our determination to continue to provide the railroads with the ultimate in efficient, money-saving automatic ballast-placing or tamping machines. Exceptional as the performance of Jackson Multiple Tampers has been, the 1950 model, now in production, is bound to top it in both production and lower cost of maintenance. Our field engineers will continue to assist supervisory personnel, on initial installations, to perfect organization and methods assuring maximum results in terms of track footage of highest quality at lowest cost.

WRITE FOR

literature, which will soon be available, giving details of the vastly improved 1950 model, JACKSON MULTIPLE TAMPER.

ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Michigan



Take Care of Driver Burns Too, When Building Up Rail Ends

When your rail-end welding gangs are out on the job, driver burns can be repaired at the same time. Manpower, tools, and supplies are all on hand to do both jobs.

The pictures show how driver burns are removed by a large Eastern railroad. The gang shown is one of several out on the line using OXWELD MW rod to build up rail ends and eliminate driver burns. Frequent checks with the rail detector car in the last five years have shown that the original soundness of the rail has been restored.

Call on OXWELD for details on how this procedure can be adapted to your track programs.

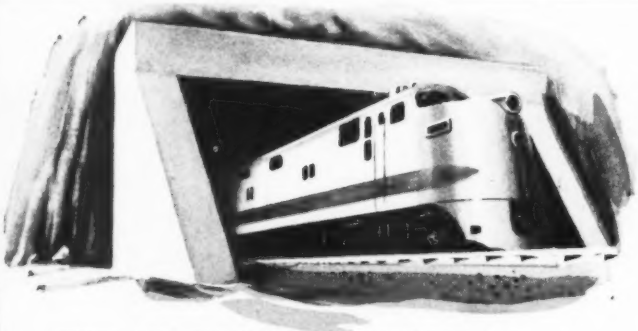
Here's how easily driver burns are built up with OXWELD MW rod.

The term "Oxweld" is a registered trade-mark.

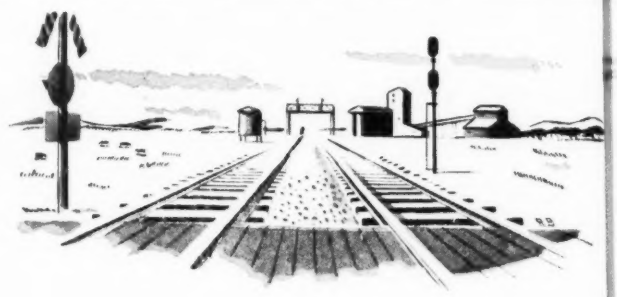
THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
Carbide and Carbon Building Chicago and New York
In Canada:
Canadian Railroad Service Company, Limited, Toronto

SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

HOW TO Stop EXCESSIVE RAIL

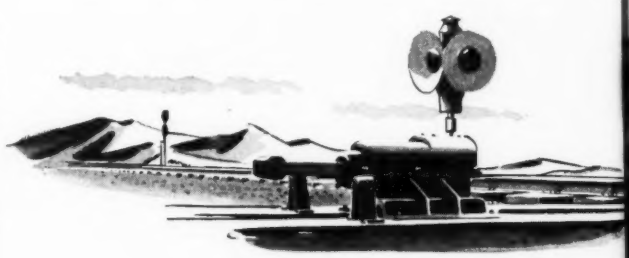


TUNNEL ACIDS and MOISTURE, notoriously rough on rails, cause excessive corrosion and shorten rail life. Now you can protect tunnel track by coating with tough, corrosion-resistant R-M Rail Coating. Especially formulated to resist sulphuric acid fumes and moisture. Won't peel or chip.



GRADE CROSSING PLANKS trap water and winter road salts around rails. R-M Rail Coating protects rails from salt and water, prolongs rail life. Unusual flexibility resists shock and powerful impact of train wheels. Flexibility and adhesion are retained even during severely cold winter periods.

prolong
rail life

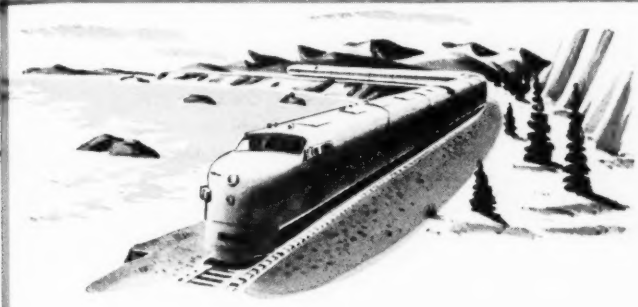


WRITE NOW for descriptive brochure and full details of railway field applications and accelerated laboratory tests made with R-M Rail Coating. Included is a review of Rinshed-Mason scientific developments in the field of protective coatings for industry.

WITH R-M

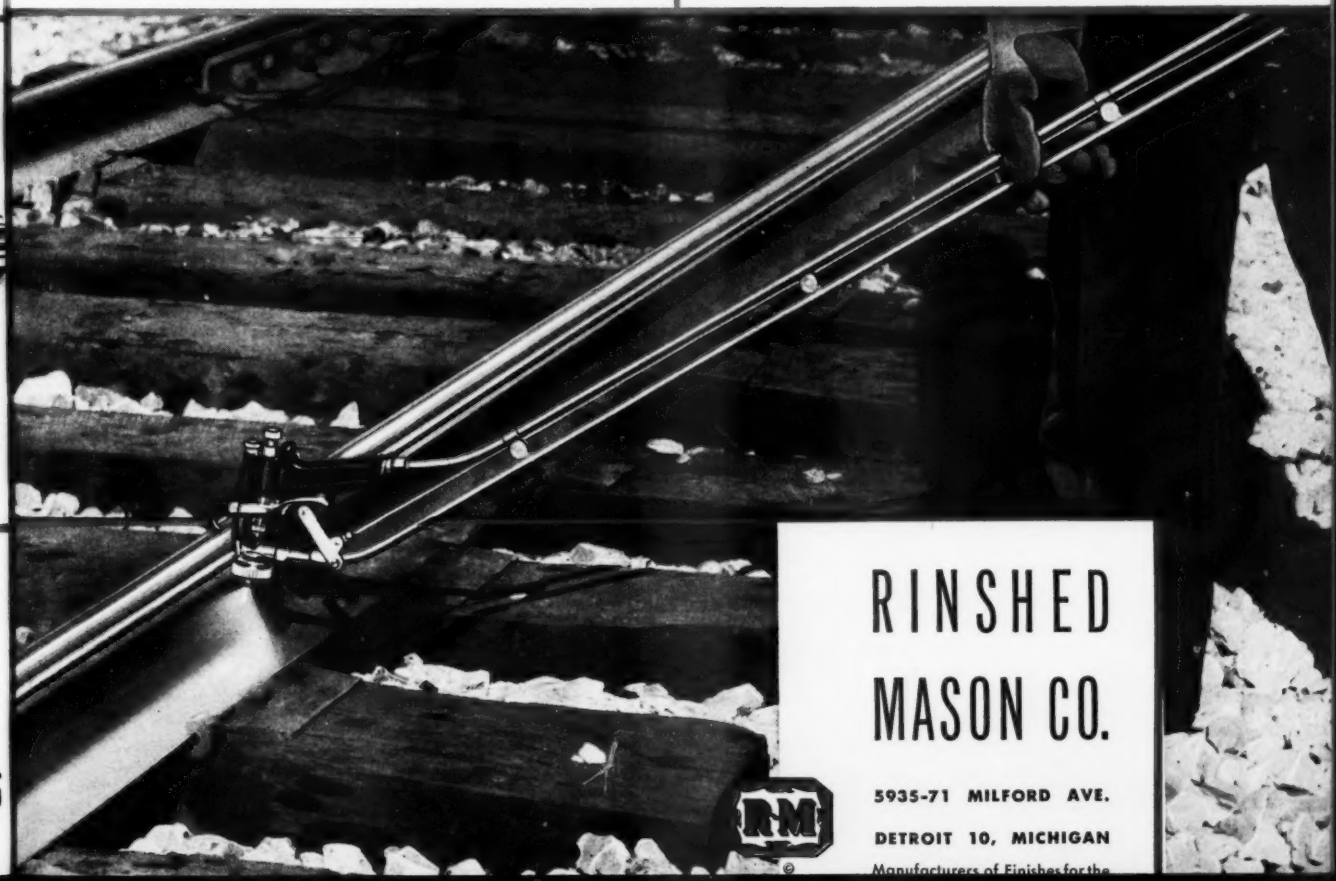
CORROSION-RESISTANT RAIL COATING

corrosion



SALT WATER SPRAY bites into track running close to sea shore or salt water areas; cuts many years of life from costly steel rails. R-M Rail Coating resists damaging salt spray; prevents corrosion caused from refrigerator-car brine drippings. Excellent adhesive qualities and abrasive resistance.

BRIDGES and other structural steel work, especially those which may be subjected to corrosive elements or severe atmospheric conditions, need the positive protection that R-M Coating affords. This smooth-flowing finish requires no special equipment; can be easily brushed, sprayed or dipped.



RINSHED MASON CO.

5935-71 MILFORD AVE.

DETROIT 10, MICHIGAN

Manufacturers of Finishes for the

How to find "gold" in that next tunnel

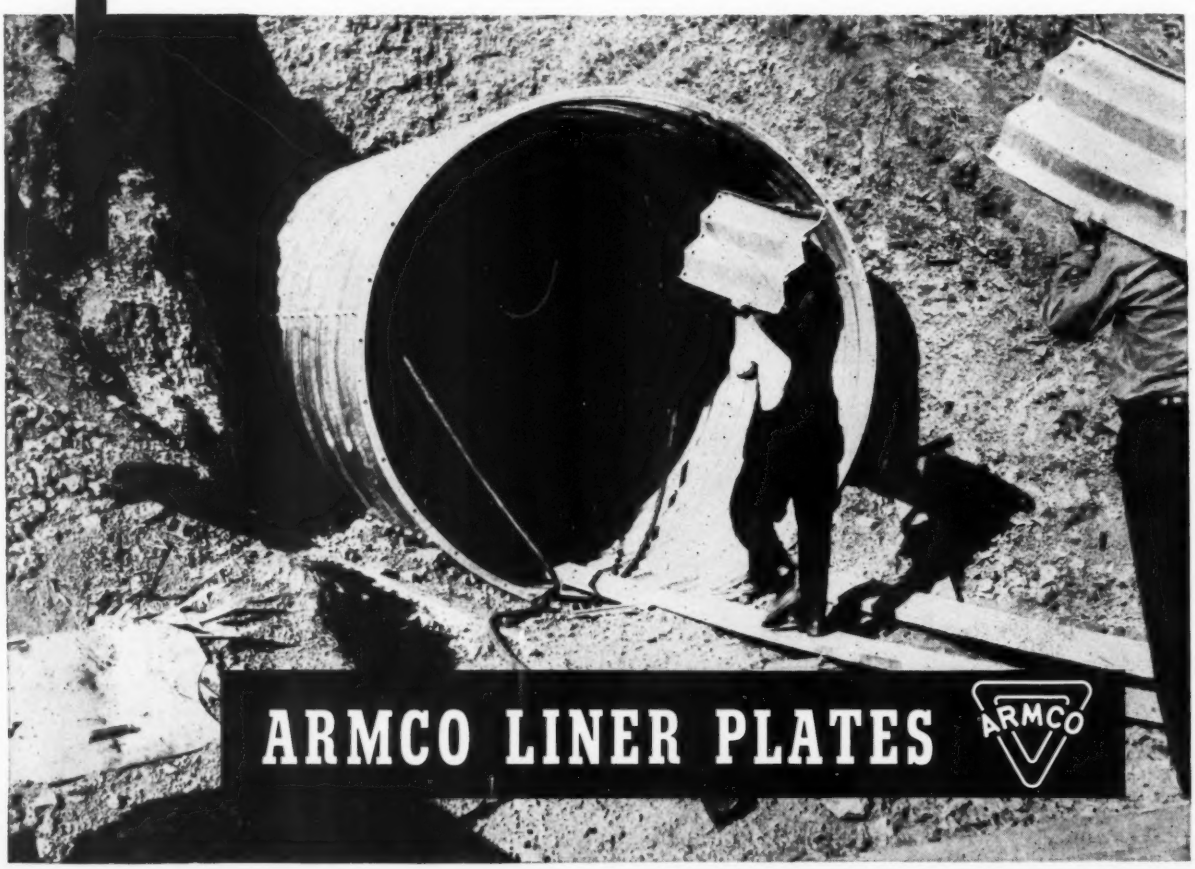
You'll never know how profitable tunneling can be until you have tried Armco Liner Plates.

Although amply strong, these lightweight, corrugated metal plates are easy to handle. A single, unskilled workman can carry, hold and bolt into place an Armco Liner Section. Only a structural wrench is needed.

But that's not all. Thanks to their high strength-to-weight ratio, these plates have no excess bulk. It means less excavation—less dirt to be handled and hauled away. Jobs are completed quickly, costs are low.

Armco Liner Plates are ideal for installing new openings or relining existing structures in diameters from 45 ¼ inches to 33 feet. Use them for conduits, tunnels, underpasses, and wherever else you need the protection and other advantages of a steel liner. Write for complete information. Armco Drainage & Metal Products, Inc., 1800 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation.

Export: Armco International Corporation.



ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

Products Index

A

Air Compressors ..24, 28, 78, 84
Air Cooled Engines ..81
Anchors, Rail ..1, 22, 36, 67
Asphalt ..4
Axes ..36

B

Ballast Cleaners ..10, 11, 79
Ballast Forks ..36
Band Saws ..81
Bits ..24
Bolts ..81
Buckets ..21
Bulldozers ..7, 23

C

Car Stops ..80
Chemical Weed Killers ..77
Clamshell Buckets ..21
Clean Treatments ..9
Clutch Assemblies ..81
Concrete Mixers ..84
Corrosion-Resistant Coatings ..16, 17
Corrugated Culverts ..18
Crane Attachments ..72
Cranes ..5, 21, 26, 29, 64, 69, 72, 74
Crawler Cranes ..5
Crawler Tractors ..13
Creosote Sprayers ..73
Cribbing Machines ..10, 11, 79
Crossings ..3
Culverts ..18

D

Diesel Engines ..7, 13, 28
Diesel Locomotive Cranes ..26, 69
Draglines ..29
Drills ..24
Dual-Control Cranes ..21
Dump Truck Hoists ..31

E

Earthmoving Equipment ..13, 23
Electric Switch Locks ..75
Electric Tie Tampers ..14
Electric Tools ..28
Engines ..81

F

Flangeway Cleaners ..73
Floodlights ..64
Floor Plates ..64
Fuel Oil Pumps ..80

G

Gasoline Engines ..81
Grinders ..24
Grinding Wheels ..24
Grouting Asphalt ..4
Grouting Machines ..84
Guard Rail Bolts ..81

H

Hammers ..36
Hand Operated Switch Machines ..75
Hatchets ..36
Heat Treated Crossings ..3
Hinged Switch Rods ..75
Hoes ..36
Hydraulic Hoists ..31
Hydraulic Jacks ..79
Hydraulic Tools ..28

I

Insulations ..8

J

Jack Supports ..79
Jacks ..76, 79

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

First Class Permit No. 32418, Sec. 510 P.L.&R. Chicago, Ill.

Postage Will be Paid by Addressee

RAILWAY ENGINEERING & MAINTENANCE
30 Church Street
New York 7, New York

READER SERVICE DEPT.

RAILWAY ENGINEERING AND MAINTENANCE January, 1950

Please send me additional products information as requested below.

☐ Literature Only ☐ Desire to see Representative ☐ Price Data

Product and Page No. .....
" " " .....
" " " .....
" " " .....

Name .....

Title or Position .....

Company .....

Address..... City..... Zone..... State.....

(Please Fill Out Card in Full)

L

Lag Screws ---81
Lever Jacks ---79
Locomotive Cranes ---21, 26, 69

M

Mechanical Devices ---27
Motor Cars ---34, 73
Motor Graders ---23

O

On-Track Tampers ---10, 11, 14
Ore Bridges ---21
Oxy-Acetylene Service ---15
Oxy-Acetylene Welding ---15

P

Pads ---12
Paint Sprayers ---24
Pentachlorophenol ---9
Pipe Insulations ---8
Pneumatic Tie Tampers ---78, 84
Pneumatic Tools ---24, 28
Power Units ---13, 23, 81
Protective Coatings ---16, 17
Pull Shovels ---5
Pumps ---80, 84

R

Rail Anchors ---1, 22, 36, 67
Rail Cranes ---26, 74
Rail Expanders ---79
Rail Forks ---36
Rail Grinders ---24
Rail Joint Oilers ---73
Rail Joint Shims ---36
Railroad Crossings ---3
Rock Drills ---28
Roller Bearings ---25
Rust Preventives ---16, 17

S

Saws ---81
Scaling Tools ---28
Scoops ---36
Scrapers ---13
Screw Jacks ---79
Scuffle Hoes ---36
Scythes ---36
Shovels ---5, 29, 36
Sound Proofing Materials ---8
Spike Drivers ---27
Spring Washers ---2, 24, 71, 83
Switch Roller Bearings ---75

T

Tie Borers ---33
Tie Cutters ---73
Tie Drying ---6
Tie Pads ---12, 79
Tie Plate Spacers ---73
Tie Tampers ---10, 11, 30
---42, 78, 84
Timber Bolts ---81
Timber Conservation ---6
Torque-Connector Cranes ---69
Track Jacks ---76, 79
Track Shovels ---36
Track Wrenches ---33
Tractors ---13, 23
Treated Ties ---6
Truck Bodies ---31
Truck Cranes ---5, 29, 69, 72
Truck Hoists ---31
Tunnel Plates ---18

U

Unit Tampers ---30

V

Vacuum Pumps ---28

W

Wagon Cranes ---69
Washers, Spring ---2, 24, 71, 83
Weed Burners ---73
Weed Cutters ---36
Weed Killers ---52, 77
Weed Sprayers ---64
Welding Rods ---15
Well Water Systems ---80
Wheel Stops ---80
Wheel Tractors ---13
Wire Brush Machines ---28
Wood Preservatives ---9
Wrecking Cranes ---21

RAILWAY ENGINEERING AND MAINTENANCE

January, 1950

Please send me additional products information as requested below.

☐ Literature Only ☐ Desire to see Representative ☐ Price Data

Product and Page No. .....

" " " .....

" " " .....

" " " .....

Name .....

Title or Position .....

Company .....

Address..... City..... Zone..... State.....

(*Please Fill Out Card in Full*)

Postage Will be Paid by Addressee

BUSINESS REPLY CARD

First Class Permit No. 32418, Sec. 510, P.L.&R. Chicago, Ill.

No Postage Stamp Necessary If Mailed in the United States

RAILWAY ENGINEERING & MAINTENANCE

30 Church Street

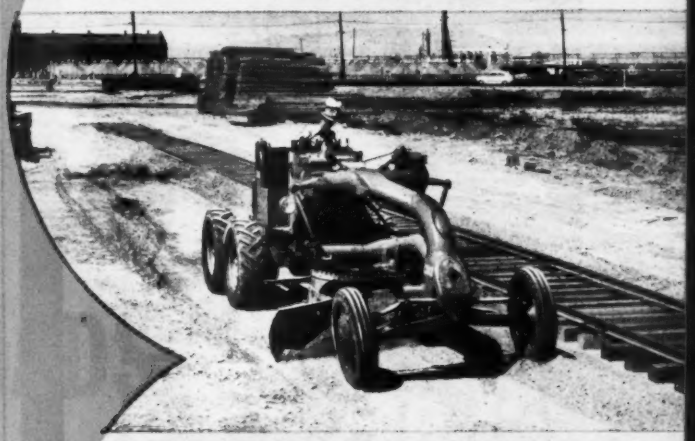
New York 7, New York

READER SERVICE DEPT.

Mechanize

with OFF-Track Equipment to do more work in fewer hours

CONSTRUCTION AND MAINTENANCE—A-C Diesel Tractors work with dozers, scrapers, shovels, winches, other equipment on all types of construction and maintenance, derailments, repairs. Four models, 11,000-lb. to world's largest, 40,000-lb.



GRADE, BUILD ACCESS ROADS — Slope, backfill, cut out and reshape ballast, remove snow, etc. with A-C Motor Graders. Four heavy-duty diesel models, 50.4 to 104 b. hp., and low-cost gasoline model for light work.

MOW, HAUL, SWEEP, do many other jobs with A-C Wheel Tractors. Compactly built, maneuver easily, turn short . . . plenty of power! Electric lights and starting. Built rugged for tough railroad service.

ANY POWER REQUIREMENT — Low-cost A-C Power Units are high in torque, provide heavy-duty power for any service. Nation-wide service. Choice of fuels. Five models, 15 to 110 hp.

Operating free of the tracks, Allis-Chalmers 2-cycle diesel tractors and motor graders keep working hour after hour — while trains move through on schedule. They are quickly moved from job to job by flat car, trailer or under their own power. Go into action immediately. Handle work close to or far from tracks. Operate more safely, at lower cost, and put in as much as 50 percent more working time than rail-bound equipment.

Write for complete information, or let us put you in touch with your Allis-Chalmers railroad dealer for a demonstration.

THERE ARE RIGHT SIZE AND TYPE ALLIS-CHALMERS MACHINES AND AUXILIARY EQUIPMENT FOR EVERY JOB

ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE, U. S. A.

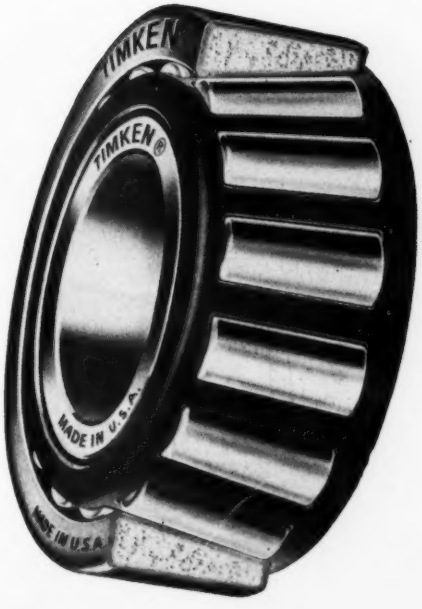
NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN® TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

DUE to its tapered construction, a Timken® bearing takes any combination of radial and thrust loads. No special thrust bearings or washers are needed. Your designs can be simplified, space saved.

Timken bearings hold shafts in rigid alignment, preventing wobble or end-play. Due to precision manufacture and true rolling motion, friction is practically eliminated. And the line contact between rolls and races provides maximum load-carrying capacity.

Made of the finest material ever developed for tapered roller bearings—Timken fine alloy steel—Timken bearings normally last the life of the machines in which they're used.

No other bearing can bring you all the advantages you get with Timken tapered roller bearings. Be sure you have them in the machinery you build or buy. Look for the trade-mark, "Timken" on the bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".



TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

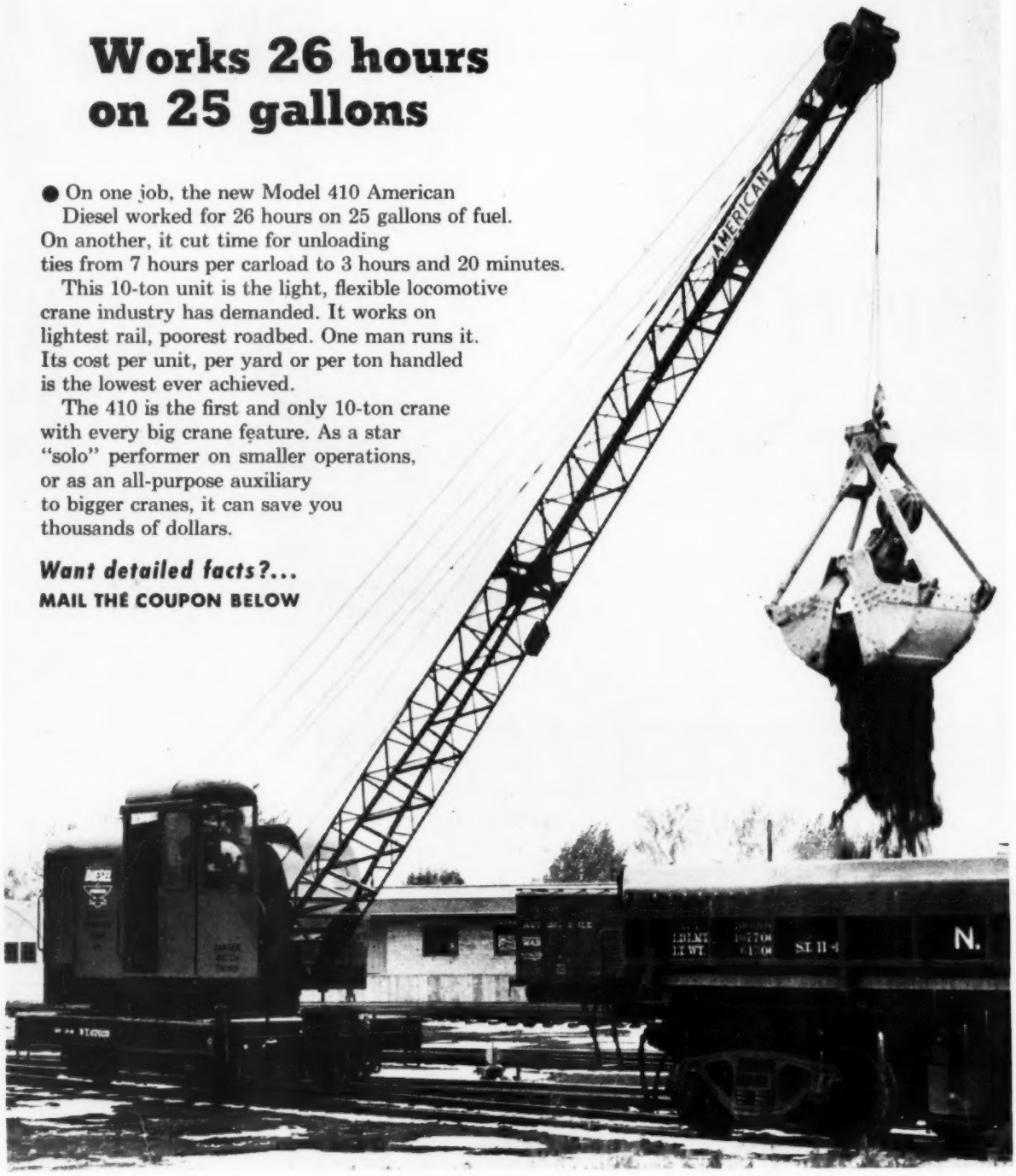
Works 26 hours on 25 gallons

● On one job, the new Model 410 American Diesel worked for 26 hours on 25 gallons of fuel. On another, it cut time for unloading ties from 7 hours per carload to 3 hours and 20 minutes.

This 10-ton unit is the light, flexible locomotive crane industry has demanded. It works on lightest rail, poorest roadbed. One man runs it. Its cost per unit, per yard or per ton handled is the lowest ever achieved.

The 410 is the first and only 10-ton crane with every big crane feature. As a star "solo" performer on smaller operations, or as an all-purpose auxiliary to bigger cranes, it can save you thousands of dollars.

Want detailed facts?...
MAIL THE COUPON BELOW



American Hoist
and DERRICK COMPANY
St. Paul 1, Minnesota

Plant No. 2: So. Kearny, N. J.

Sales Offices: NEW YORK • PITTSBURGH • CHICAGO

American Hoist and Derrick Co. 619
ST. PAUL 1, MINNESOTA

● Please send information on the American Model 410 Diesel Locomotive Crane.

*Name*_____

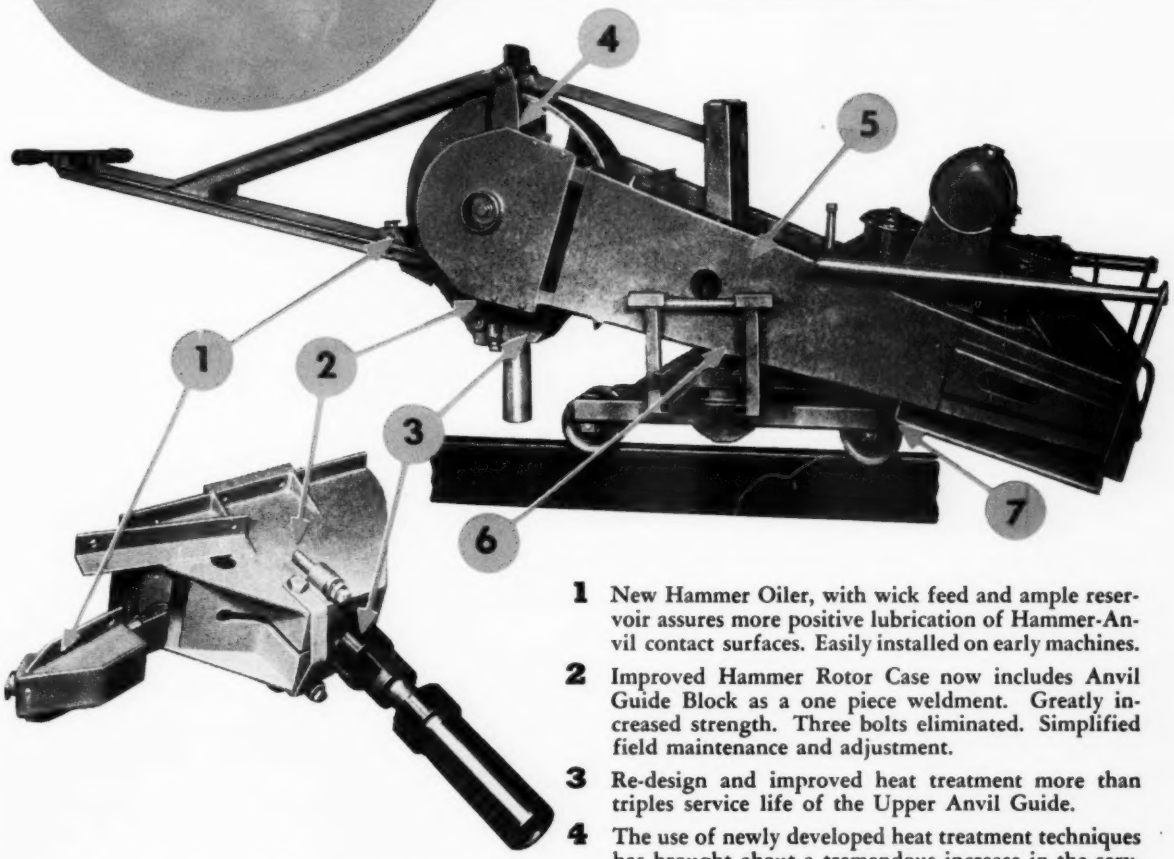
*Company*_____

*Address*_____

*City*_____ *State*_____

Here's a GOOD product made even BETTER

The Improved NORDBERG Spike Hammer



1 New Hammer Oiler, with wick feed and ample reservoir assures more positive lubrication of Hammer-Anvil contact surfaces. Easily installed on early machines.

2 Improved Hammer Rotor Case now includes Anvil Guide Block as a one piece weldment. Greatly increased strength. Three bolts eliminated. Simplified field maintenance and adjustment.

3 Re-design and improved heat treatment more than triples service life of the Upper Anvil Guide.

4 The use of newly developed heat treatment techniques has brought about a tremendous increase in the service life of the rotating Hammer.

5 Improved Guard completely encloses V-Belt Drive.

6 Less effort required to move and spot because of improved Truck Rollers.

7 By strengthening the Frames at many points, vibration has been minimized and the machine made more rugged.

These Nordberg Spike Hammer improvements are the result of thorough field tests which have extended over more than a year. We appreciate the cooperative assistance our customers have given us to make these improvements possible. Their help has enabled us to give YOU a better Spike Hammer.

Call or write for complete details.

R150

Look to NORDBERG

. . . for continually improved TRACK MAINTENANCE MACHINERY *to do a Better, Faster Maintenance Job at Lower Cost*

NORDBERG MFG. CO., Milwaukee 7, Wisconsin

for faster removal of

rust

scale

paint

The easily held CP-404 strikes 10,000 B.P.M.—works in close quarters.

use CP Pneumatic Scaling Tools

Heavy rust, scale or paint is readily removed, without damage to metal surfaces, by rapid vibratory action of CP Scalers. Chisels are not required; the fast-hitting piston hammers act as the chisel. CP Scalers are available in single and triple piston models.

* * *

CP Wire Brush Machines, either with straight or pistol grip handles, are available with a wide choice of radial and cup wire brushes for loose scale. Range of operating speeds runs from 4200 to 9000 R.P.M.

Write for Bulletin SP-3008

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

LORAIN HANDLES RAIL *ON THE RUN* For C. & I. M. Railroad

• The Chicago & Illinois Midland Railroad Co. gives maintenance work the "high-ball" signal with their new Lorain-TL Crawler Crane. Here, near Long Branch, Illinois, it works from atop a flat car to pick up and load old rails that have been replaced with new, heavier rails. The Lorain also loads and unloads tie plates angle bars, and anchors along a 3-1/2 mile stretch of track.

Whether the operation calls for on-the-car service like this, or off-the-car work . . . whether it's on-the-track or off-the-track work, a Lorain will do the job, just as C&IM's Lorain also works as a clamshell and dragline for maintenance, excavating and grading.

The C&IM Railroad is taking full advantage of the many Lorain features listed below, to increase output, save time, lower costs and reduce labor. You can do the same—and your nearest Thew-Lorain Distributor will be glad to give you all the facts.

THE THEW SHOVEL CO., LORAIN, OHIO

PUT THESE TL FEATURES TO WORK FOR YOU . . .

Interchangeable "packaged" components — each major component may be removed and replaced as a complete unit.

5 identical clutches — 5 shoe clutches, with interchangeable parts, control all turntable operations.

Oil-enclosed cut gears — all gears are machine cut; all except 2 intermittently used gears, run in oil.

Anti-friction bearings — used on all turntable power shafts and clutch friction drums.

2 crawler speeds — 2 speeds, controlled from operator's position, available in both directions.

Drop-forged crawler treads — stronger, longer life.

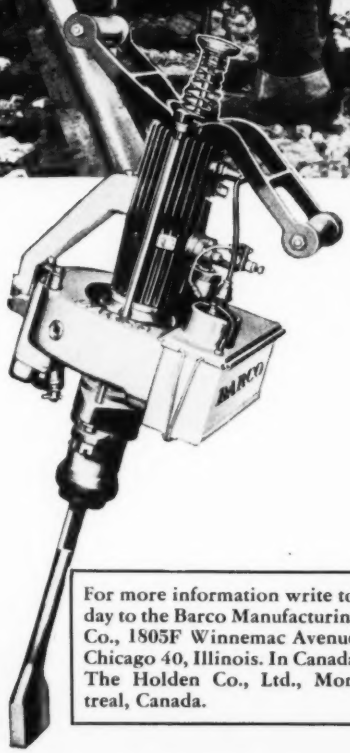
Oil enclosed crawler propelling mechanism — primary propelling mechanism runs in oil bath.

THEW LORAIN®

SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES

More BARCOS will help solve the 40-hour week

By maintaining track with less large gang work.
BARCO has more power and will tamp more ties better.
Will tamp cemented ballast.
Will not tie up the tracks.
May be used for other work when not tamping.
No expensive equipment to be tied up for months each year.



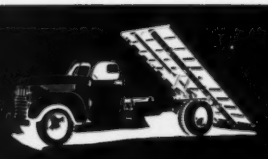
BARCO

UNIT TYTAMPERS

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

For more information write today to the Barco Manufacturing Co., 1805F Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

A NEW *ANGLE* ON TRACK WORK

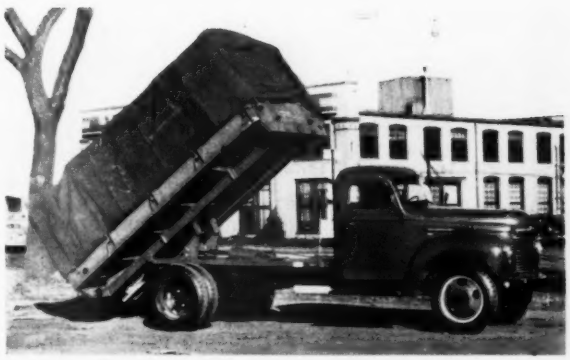


ST. PAUL DUMP IT HOISTS

convert platform trucks into DUMPS; increase work output.

Doing a full week's track work in only 5 days puts a premium on MOBILITY and SPEED. One truck like the unit pictured here can increase the work output of several regular track crews so that a week's work will STILL GET DONE each week. Here's a few hows:

1. Reduce hazardous travel of work crews over main line trackage.
2. Less time spent delivering tools, workers and materials (including work cars) where needed.
3. Workers can be more specialized, because, being more mobile, the specialists can help out regular workers along many miles of track.
4. Addition of a DUMP IT HOIST multiplies the truck's usefulness. Hoist instantly unloads 6 to 7 tons of ties, ballast, timbers, spikes, plates, frogs, etc. Hoist also tips body for manual or winch loading of work car.



Platform or cargo-type bodies may be fitted with canvas tops, down folding seats etc., for transporting work crews. A folding step at rear makes it easy for personnel to leave or enter.

A St. Paul DUMP IT Hoist completes the picture, making any standard truck into an all-purpose utility and maintenance DUMP unit.

1. Steel long beams furnished with hoists.
2. Low mounting for easy loading.
3. Automatic safety body lock.
4. St. Paul bronze bushing pump.
5. Safety overload valve.

Recommended installation is a 12 foot platform or cargo body with DUMP IT Pony Hoist on a truck with cab-to-axle dimension of approximately 84 inches. Price, DUMP IT Pony Hoist with channel steel long-beams and all fittings, ready to install, $365.00, f.o.b. Minneapolis, not mounted.

USE THE COUPON... TO ORDER... TO OBTAIN LITERATURE

ST. PAUL DIVISION, Gar Wood Industries, Inc.
2207 University Ave., S.E., Minneapolis 14, Minnesota

☐ Enter our order No._____ for (quantity)_____
DUMP IT Pony Hoists @ $365.00 f.o.b. Minneapolis. To fit following truck:
Make_____ Model_____
Year_____ Wheelbase_____ Cab-to-axle_____ Max. Load_____ Tons
☐ Send full information on above installation.
*Name of Company*_____
*Street and Number*_____
*City*_____ *Zone*____ *State*_____
ATTENTION MR._____ TITLE_____

ST. PAUL DIVISION
Gar Wood Industries, Inc.
2207 University Avenue, Southeast
Minneapolis 14,
Minnesota

St. Paul HYDRAULIC

No. 253 of a series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 W. MONROE STREET
CHICAGO 3, ILL.

Subject: Another Pre-eminent Publication

January 1, 1950

Dear Readers:

As readers of Railway Engineering and Maintenance you stand out among railroad men as those who are going the "extra mile" to improve railway engineering and maintenance practices and to better their position in the field. It marks you as among those with ambition, initiative, ability, and a special sense of loyalty to railroading and your company. For the latest authenic information relative to maintenance problems and practices, you must read Railway Engineering and Maintenance. It is edited specifically for men with your responsibilities and has top rank among railroad publications within its departmental scope.

Many of you, with a greater breadth of interest and vision in railroading, and ambitions beyond your immediate assignments or department, also read Railway Age, our parent publication, and more of you would be reading it regularly, I am sure, if you were better acquainted with it, knew of its outstanding rank in the estimation of all classes of railway officers, and realized how it could broaden your own vision and understanding of railroad problems and practices as a whole. As Western Editor of Railway Age, let me tell you a few facts about this publication and its acceptance among railroad men.

A weekly, published 52 times a year, Railway Age covers the activities of all departments—executive, operating, traffic, engineering, mechanical, signal, purchases and stores, and financial--and features all happenings in and related to the railroad field, largely from a news standpoint. To do this most effectively it is staffed by 27 editorial specialists who cover railway activities in all parts of the country, and who, for that publication, do what we editors of Maintenance do for you, in a departmental way, in Railway Engineering and Maintenance.

That they are successful is testified to by the long pre-eminence of Railway Age in the railway field, and, more concretely, and current, the results of a recent independent survey among 1,351 railroad officers in all departments, made by the Recording and Statistical Corporation, New York. In that survey the names of six publications were listed--Business Week, Modern Railroads, Newsweek, Railway Age, Time, and U. S. News--in the order given, and those questioned were asked (1) Which contributes most to the railway industry? and (2) Which is the most help to you in your work?

Among all classes of railway officers, answers to Question 1 showed 94.0 per cent voting for Railway Age in comparison with its nearest competitor, and in answer to Question 2, 83.8 per cent voted in favor of the Age. Among the 270 engineering and maintenance officers questioned, the percentages were 92.3 ahd 78.5, respectively, in favor of Railway Age.

I know that men of your position and responsibility can't get along without Railway Engineering and Maintenance, covering as it does your immediate department, but I am sure that more of you than at present, even in minor supervisory capacities, would profit greatly by reading Railway Age regularly, to get currently the broad, overall picture of railroading? The survey quoted above proves unmistakenly that, to get this picture, Railway Age is the outstanding choice of railway officers.

If you are not now reading Railway Age regularly, why not start with the New Year? It will cost you less than 10 cents a copy on a two-year basis. I shall be pleased to enter a subscription for you if you desire.

Yours for happiness and better railroading in 1950.

Sincerely,

Neal D. Howard

NDH:ag

Editor

MEMBERS: AUDIT BUREAU OF CIRCULATIONS AND ASSOCIATED BUSINESS PAPERS, INC.

Fairmont

. . . workhorse of the railroads

Performance ON THE JOB COUNTS

We doubt very much whether there is a railway maintenance job of any descrip tion that has not, at some time or another, been made easier by the use of Fairmon Section Cars. These rugged, dependable vehicles have written a unique record in th past 40 years—a record that extends over thousands and thousands of miles of right of-way in virtually every country of the world. It is only logical that Fairmont shoul long since have become the first name in railway maintenance equipment—for Fairmon has devoted itself exclusively to these problems for more than 40 years. And in ever one of those years, Fairmont equipment has proved itself worthy of the slogan— "Performance on the Job Counts." Fairmont Railway Motors, Inc., Fairmont, Minn

Railway Engineering and Maintenance

NAME REGISTERED U. S. PATENT OFFICE

VOL. 46, NO. 1 JANUARY, 1950

Editorials ---- 37

1949 in Review—Annual Index

Railways Spent $17,500,000 for Work Equipment in 1949 ---- 39

A total of 8,700 power units was purchased during the past year by 178 roads in the United States, Canada and Mexico

Big Machines Reduce Tamping Costs ---- 42

Discusses the economies, as well as other benefits, being realized by the New York Central through the use of Power Ballasters

Self-Deicing Hydrants for Large Coach Yard ---- 45

Describes a recently-developed frostproof device which conforms to the sanitary requirements of various regulatory bodies

Long Bridge Raised 15 Ft. Under Traffic ---- 46

H. J. McKenzie tells how the Southern Pacific, as a flood-protective measure, elevated its structure over the Devil's river in Texas

The Railroader's Pursuit of Happiness ---- 50

Abstract of a challenging address by F. S. Schwinn before a recent meeting of the New England Railroad Club at Boston, Mass.

Solving the Weed Problem About Timber Trestles ---- 52

Lee Mayfield tells of the beneficial results being obtained on the Missouri Pacific through the application of borate ore

Intercepting Ditches and Timber Flumes Solve Slide Problem ---- 54

The measures taken by the Erie in successfully stabilizing a fill over a deep ravine on its River line in New York, are described

What's the Answer? ---- 57

Products of Manufacturers ---- 64

The Month's News ---- 66

Published on the first day of each month by the

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 West Monroe St., Chicago 3

NEW YORK 7, 30 Church Street

WASHINGTON, D.C., 4, 1081 National Press Bldg.

CLEVELAND 13, Terminal Tower

SEATTLE 1, 1914 Minors Ave.

LOS ANGELES 13, 816 West Fifth Ave.

DALLAS 4, 2909 Maple Ave.

Subscription price in the United States and Possessions and Canada, 1 year $2, 2 years $3; other countries in Western Hemisphere, 1 year $5, 2 years $8; all other countries, 1 year $7, 2 years $12. Single copies, 50 cents each. Address H. E. McCandless, Circulation Manager, 30 Church Street, New York 7, N.Y.

Member of the Associated Business Papers (A.B.P.) and of the Audit Bureau of Circulations (A.B.C.), and is indexed by Engineering Index, Inc.

PRINTED IN U.S.A.

YOU CAN HAVE AN INDEX

Copies of the index for 1949 will be issued to subscribers asking for them. If you desire a copy of the index please send in the coupon below.

Circulation Manager
Railway Engineering and Maintenance
30 Church St., New York 7, N. Y.

Please send index to address below

Name ----

Street ----

City ----

1949 in Review —

Efficiency Improved — Many Indices Off — Prospects Up

For reasons largely beyond the control of the railroads, including the effects of the coal and steel strikes, 1949 was far from what it should have been in railroad traffic, earnings, magnitude of capital improvements, and expenditures for maintenance of roadway and structures. However, performance and efficiency of railroad operation continued upward, which portends increases in expenditures for needed improvements and maintenance all along the line with the return of volume traffic—which, with generally improved economic conditions, is being predicted in many quarters for the year ahead.

According to William T. Faricy, president of the Association of American Railroads, in a year-end statement, both freight and passenger traffic were off during 1949, which was seriously reflected in earnings, but the railroads pushed forward their four-billion dollar program of improvements in plant and equipment, started as soon as the war ended, with the result that new peaks of performance were reached, with the prospect of still greater efficiency in the future as traffic increases.

Pointing to losses during the year, Mr. Faricy said that loadings of revenue freight in the past 12 months totaled 36 million cars, a reduction of 16 per cent compared with 1948. Freight traffic amounted to approximately 530 billion revenue ton-miles, a reduction of approximately 16.9 per cent below the preceding year.

Revenue passenger traffic in 1949 totaled 35 billion passenger miles—approximately 15 per cent less than in 1948. Nevertheless, passenger traffic during the year exceeded that in each of the 15 years prior to 1942.

On the basis of actual returns for the first ten months and an estimate for the last two months, it is expected that the net railway operating income of the roads in 1949, before interest and rentals and other fixed charges, will approximate $650 million—which is less than in any year since 1939, with the exception of 1946.

Despite the reduction in traffic, Mr. Faricy pointed out that a new high level of freight train operating efficiency was attained by the railroads in 1949. Not only were more freight cars moved per train, he said, but the average speed between terminals was higher than ever before, resulting in the greatest output of transportation per freight train hour ever recorded. The average hourly output in 1949 was 19,153 net ton-miles, compared with 18,779 in 1948, the previous high record.

The Class I railroads handled an average of 1,149 tons per freight train in 1949. While this was 27 tons less than in 1948, it was 10 tons greater than in 1944, the peak war year. At the same time a new high record in average speed of passenger trains was attained.

These records of performance were the result, in part, of the new and better locomotives and cars which have been put in service by the Class I railroads in recent years these roads having installed 1,875 new locomotives in 1949 alone—1,815 Diesel and 60 steam—the greatest number for any year since 1923. At the same time, these roads and the railroad-owned private refrigerator car companies put in service in 1949 a total of 86,000 new freight cars.

Based on actual figures for the first nine months of 1949, it is estimated that the Class I railroads spent $1,300,000,000 on the maintenance of their tracks and structures during the year. Unfortunately, this high figure for maintenance is so distorted by inflated labor costs that it does not accurately reflect the amount of work done compared with previous years. However,

it is interesting to note that while it is $48,000,000, or 3.6 per cent, less than was spent for this purpose in 1948, it is $88,000,000, or 7.2 per cent, higher than was spent for maintenance in 1947, and compares with the five-year average expenditures of $849,021,000 for the years 1925 to 1929, inclusive.

But that there was not enough maintenance work done in 1949, and for that matter in any year since the war, is seen in the latest issue of the "Railroad Maintenance Study", made annually by the Engineering Section of the Interstate Commerce Commission's Bureau of Valuation, which states that, whereas there was deferred maintenance in all fixed property items to the amount of $560,000,000 at the beginning of 1949, this figure was upped $315,000,000 during the year to bring the total amount to $875,000,000 at the beginning of 1950.

Rail Renewals Down 7.1 Per Cent

Based upon information furnished to *Railway Engineering and Maintenance* by practically all of the Class I roads of the country, these roads, as a whole, laid approximately 1,442,000 net tons of new rail in replacements during 1949. This represents a decline of about 108,000 net tons, or 7.1 per cent, compared with 1948, and a still larger decline from the 1,617,140 tons laid in 1947, the 1,807,174 tons laid in 1945, and 1,749,035 tons laid in 1944, but it was 71,500 tons more than was laid in 1946, and larger by varying amounts than was laid in any one year from 1932 through 1943.

Tie Renewals Off

While rail renewals held up fairly well, tie renewals faired relatively much worse in 1949. Again, on the basis of figures submitted by practically all of the Class I roads, tie renewals for the year were only about 30 million, which represents a further drop of about 6,842,000 ties, or about 18.5 per cent, below the abnormally low renewals in 1948. In other words, 1949 renewals represented a continuation, at an accelerated pace, of the downward trend that has been in evidence since the end of the war, which has brought annual tie renewals for the second consecutive year to the lowest level in the history of the railroads.

Capital Expenditures Still High

Capital expenditures for improvements to the fixed property in 1949 did not quite maintain the high tempo of 1948, but their volume was, nevertheless, higher than in any other year since 1930, and will probably amount to about $320 million. This compares with the peak postwar expenditures of $350 million in 1948.

Year-end reports to this publication from practically all of the railways of the country show that, exclusive of grade crossing eliminations, more than 600 projects costing $100,000 or more, with an estimated total cost in excess of $450 million, were carried forward during 1949. The largest single category of capital improvements in progress during the year consisted of revisions of grade and alinement. Yard and terminal improvements, which held first place in dollar volume in 1948, dropped to second place in 1949, while bridge work comprised the third largest class of construction under way during the year. Grade crossing eliminations continued in 1949 at about the same pace as in the year before. Work was in progress during the year on the elimination of 241 grade crossings and the reconstruction of 60 existing grade-separation structures.

$17,500,00 for Work Equipment.

The year 1949 was another big year for maintenance-of-way and structures work equipment, but, for the same reason that held down railway operations generally, it was not as big a year as had been expected at its start, and purchases again lagged somewhat behind those of recent years. According to information furnished to *Railway Engineering and Maintenance* by all except three of the more important roads of the United States, Canada and Mexico, it is estimated that the roads of these three countries ordered in 1949 a total of 8,700 units of power tools and machines of all kinds for roadway, track, bridge, building and water service work, at a total estimated cost of approximately $17,500,000. This represents a reduction of 600 units, and about $1,200,000 from the purchases made of similar equipment in 1948, and a still larger drop in both units and dollar volume from the purchases in 1947. However, 1949 purchases were larger in number of units than in any year prior to 1944. Dollarwise, due to increased costs, last year's purchases were higher than in any year except 1948 and 1947, and equalled the purchases in 1945.

Better Year Ahead Forecast

Whatever else might be said about prospective railway activity in the years immediately ahead, and especially of the activities of the engineering and maintenance departments, it would appear certain that, in spite of the large postwar expenditures that have already been made for improvements to the fixed properties and for maintenance of way and structures, the required postwar rehabilitation job is still unfinished, and that large expenditures will continue to be needed for a number of years to come. Just how big these expenditures will be in 1950 will depend largely upon the economic condition of the country and reflected railway earnings. This being so, it is encouraging to note the favorable business outlook being forecast for the first half of 1950 by many high in government, financial and business circles, and the prediction of Mr. Faricy that freight traffic in that year will exceed that of 1949.

ANNUAL INDEX—

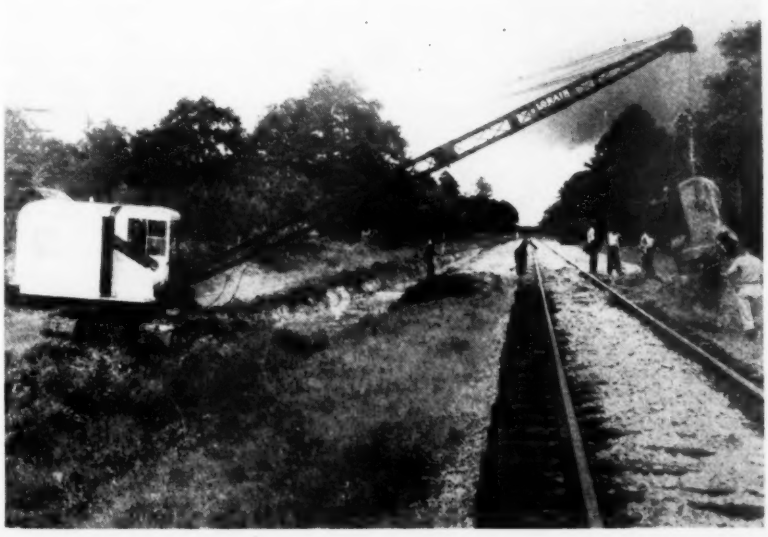
How to Obtain Your Copy

THE INDEX of all material published in *Railway Engineering and Maintenance* during 1949 will soon be ready. Those who have requested copies of the annual index in previous years will automatically have one mailed to them this year. If you have not requested a copy of the index in any prior year, but desire to have a copy of the 1949 index, all you need to do is fill out and mail the coupon included on page 35 of this issue.

Railways Spent $17,500,000 for Work Equipment in 1949

Reports from 426 companies indicate that the roads as a whole acquired 8,700 power machines and tools last year, a moderate decrease as compared with purchases in 1948

Above—A bright spot of the crane purchases in 1949 was an increase in the number of rail-laying units acquired. Below—Purchases of grading equipment, while somewhat below those of recent years, were above any year of record for prewar period

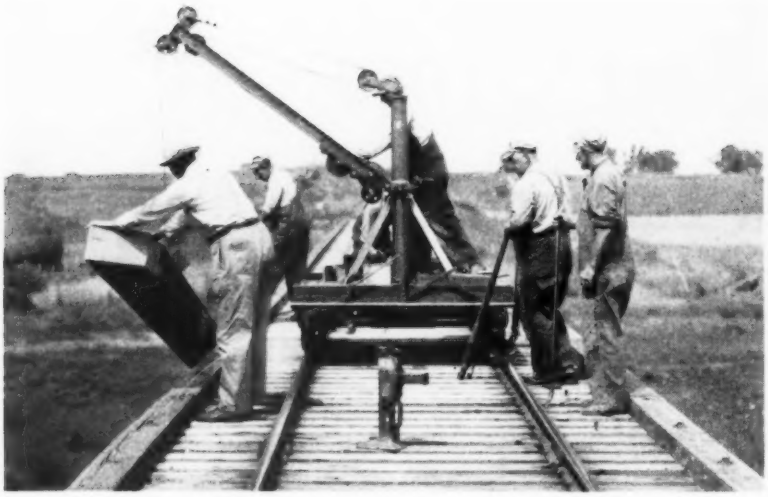


• A total of about 8,700 units of work equipment, costing approximately $17,500,000, was purchased by the railroads of the United States, Canada and Mexico in 1949. In both dollar value and in the number of units acquired, these purchases show a moderate decline as compared with 1948, when these same roads purchased an estimated 9,300 units of work equipment at a cost of $18,700,000. Notwithstanding the decline from the previous year, the number of units purchased in 1949 was larger than for any year prior to 1945, and the dollar value was of such magnitude that it has been exceeded only twice before, namely, in 1948 and in 1947.

The figures showing the number of units of work equipment purchased in 1949 is an estimate based on answers to a questionnaire send to all railways of the United States, Canada and Mexico. Replies were received from 426 roads, the equivalent of 80 per cent of all the railways of these three countries, and including all the more important roads in the United States and one large road in Canada. Of the roads submitting replies 178 reported purchase of work equipment totaling 8,114 units. In 1948, 176 roads reported purchases of work equipment totaling 8,579 units.

Conflicting Trends

With respect to those factors that determine the volume of work-equipment purchases, 1949 was a year of conflicting trends. On the positive side in this respect was the shift to the five-day week for non-operating employees on September 1—a development that gave renewed impetus to the need for machines that will permit necessary maintenance work to be done with a minimum of man-hours. Then, too, there was a sudden awakening to the unpleasant truth that the roads as a whole had reached the "end of the rope" in raising freight and



Purchases in 1949 indicate a growing realization of value of derrick cars and . . .

. . . portable power tools for B. & B. forces

passenger rates to compensate for higher labor costs, bringing them face to face with the fact that the only alternative means of keeping expenses in a proper relationship with revenues was to aim for higher efficiency. On the negative side was the decline in car loadings, due largely to the coal and steel strikes, which resulted in some curtailment in overall maintenance programs during the latter half of the year.

But maintenance men know that the five-day week is here to stay and that, while short-term fluctuations in the volume of railroad business may have a temporary adverse effect on work-equipment purchases, the need for increased mechanization will demand that the railroads re-enter the market again and again, and for increasing numbers of new and replacement units, if the maintenance departments are to cope with the situation facing them. In all probability it was this situation that caused at least ten roads to purchase a record amount of equipment in 1949, one of which tripled its highest previous expenditures. Another nine roads purchased more equipment than in any year except in 1944 or 1945, when their purchases reached a peak.

The purchases in 1949 of machines used in carrying out ballasting and surfacing programs reflect the changes that are taking place in the equipment and practices employed for this work. First, however, it is important to record that the total number of units in this category (1,999) that was acquired by the reporting railroads represented a sharp increase as compared with the 791 such units that were reported purchased in 1948. Thus, in the total number of units purchased in 1949, this category exceeded that of any other single classification, including motor cars which heretofore have constituted the top-ranking group.

Unit Tampers Up Sharply

Largely responsible for this sharp upturn in the number of machines acquired for ballasting and surfacing work was an increase in the number of unit tampers purchased from 117 in 1948 to 968 in 1949. However, there was also a substantial increase in the purchase of pneumatic and electric tie-tamping outfits, which went up from 302 in 1948 to 386 in 1949.Furthermore, a continuance of the trend toward the use of large on-track tamping machines was reflected in the purchase of 56 units of this type, compared with 50 in 1948. Other reported purchases of ballasting and surfacing equipment included 435 tie-tamping tools, 38 power jacks, 14 ballast diskers, and 2 ballast cars.

Although the number of motor cars purchased showed a decline in 1949, it still represented the second largest category of work equipment purchases, measured by the number of units acquired. The 178 railroads reporting the purchase of work equipment in 1949 bought in that year a total of 1,462 motor cars. This figure represents a considerable decrease as compared with 1948 when 2,175 motor cars were acquired by the reporting railroads. Purchases of push cars and trailers declined in about the same proportion. In 1949, 847 units of this type were acquired, as compared with 1,307 in the previous year. It is interesting to note, in these days of extensive mechanization, that the railroads acquired 66 hand cars in 1949, a sharp increase as compared with 1948 when 25 such units were purchased. These units are not included in the totals given for trailers and push cars.

Purchases of highway transport equipment in 1949 slipped slightly below the peak established in the previous year. Purchases of these units in 1949 included 173 automobiles, 737 trucks, and 21 trailers, a total of 931 units. In 1948 the railroads acquired 225 passenger automobiles, 763 trucks and 19 trailers, a total of 1,007 units. However, the purchases of such equipment in 1949 were higher than for any previous year (except 1948), comparing with 751 high way vehicles acquired in 1947, 554 in 1946, and 410 in 1945.

Cranes comprised another category of equipment and was acquired by the railroads in smaller numbers last year than in 1948. A total of 74 machines of this type was acquired in 1949, as compared with 126 reported purchased in 1948. However, here again, the comparison is with a peak figure. In other words, such purchases in

The purchases of pneumatic tie-tamping outfits increased substantially in 1949

1948 were second only to 1946, when 130 cranes were reported purchased.

A bright spot of the crane purchases in 1949 was an increase in the number of rail-laying units acquired. Specifically, 42 units of this type were purchased, as compared with 34 in 1948. It is also interesting to note that the number of derrick cars acquired in 1949, amounting to 52 units, was an increase as compared with the 50 machines of this type purchased in 1948.

The grading units constituted another category of work equipment of which the purchases in 1949 fell below the previous year. The reported purchases of such units in 1949 came to 241, which compared with purchases of 280 such units in 1948. Thus, while the purchases of grading equipment slipped somewhat below those of recent years, they were far above any year of record for the prewar period and even higher than those during the early war years.

Reflecting a moderate decline in the amount of new rail laid last year, the purchase of work equipment acquired especially for this purpose fell somewhat below 1948. Specifically, the total units acquired for this purpose in 1949 including the rail-laying cranes mentioned previously, came to 628 machines, compared with 845 in the previous year.

The tie tamping outfits purchased in 1948, as well as the welding outfits and paint-spray units mentioned later, all include the power plants necessary for their operation. In addition, the railroads reported the purchase of a considerable number of power plants to replace worn-out units and to supply power for the operation of additional power tools purchased for use in bridge and building work. The reported purchases of power plants in 1949 totaled 218 units, compared with 314 in 1948. In spite of this decrease as compared with the previous year, the purchases of power units in 1949 were higher than for any year prior to 1945.

A fact about the purchases of work equipment in 1949 that indicates the railroads have a growing realization of the value of small portable power tools for use by the bridge and building forces were increases in the purchases of a number of units in this category. For instance, a total of 195 timber saws was purchased in 1949. In 1948 only 114 timber saws was purchased. Purchases of wood borers was another bright spot, increasing from 34 in 1948 to 60 in 1949.

The equipment that the railroads purchased in 1949 for carrying out their weed-control programs was practically the same, as measured by the number of units acquired, as for the previous year. A total of 208 units of this type was purchased as compared with 219 in the previous year.

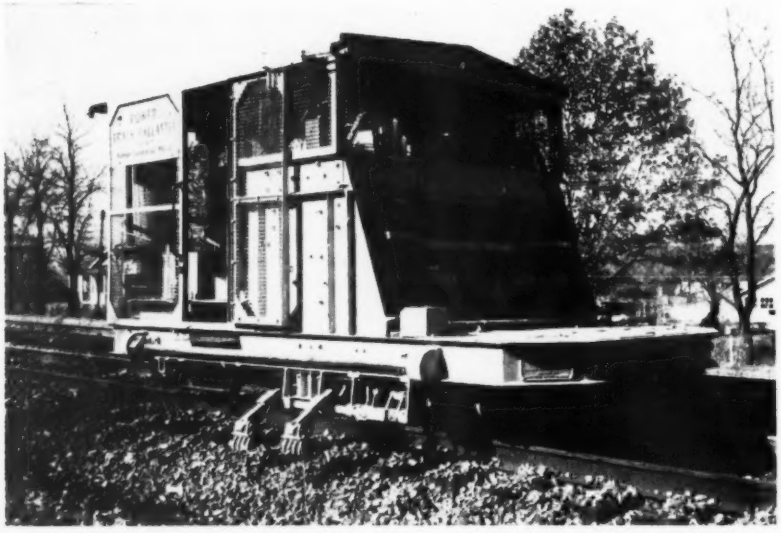
Other classifications of equipment reported purchased in 1949 in considerable numbers includes rail and flange lubricators, paint spray outfits, paving breakers, pumps, concrete mixers, welding outfits, rollers or compacting machines of various types, tie saws, etc.

Prospects for 1950

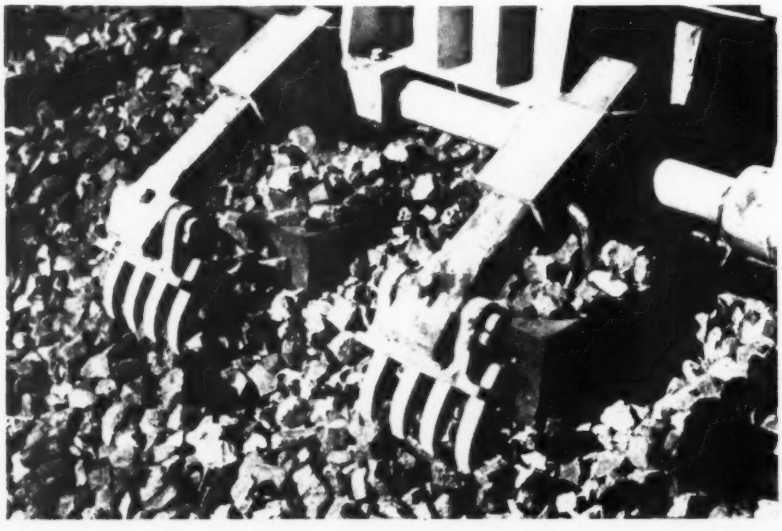
Work equipment purchases in 1950 will depend on a number of factors, including the trend of railway business in general, but it must be reiterated that the underlying demand for maximum economy must continue to exert its influence regardless of the amount of business done. Probably the most convincing evidence available of the future purchases of work equipment is contained in answers to a questionnaire sent out by a committee of the American Railway Engineering Association in which various roads were asked to state their plans regarding mechanization under the 40-hr. week. More than 70 per cent of those making replies said that they are contemplating expanding their present list of equipment by the purchase of both present types of machines and entirely new types. Other information furnished indicated that many roads are planning, or have already made, major adjustments in their work organizations, turning to fully mechanized extra and specialized gangs for all major items of out-of-face work, and reducing the responsibilities of the section forces to the minimum. On the other hand, other roads are maintaining or enlarging their section forces and section territory, and plan to mechanize these forces to the fullest extent practicable.

Wherever possible, therefore, it is evident that, to a greater extent than ever before, the roads are planning increased mechanization of their roadway and structures operations, and will be receptive to both large-production machines for their heavy seasonal programs, and the smaller, more readily portable power tools and machines for day-to-day spot repairs and renewals. In their plans they will have an increasingly large number of machines to choose from in 1950—including the many machines that have long demonstrated their adaptability, reliability and economy; machines that made their debut only during the past year as pilot models; and many other machines that are undergoing major improvements or are still in the development stage.

A Power Ballaster in operation on the . . .



Newer models of Power Ballasters, such as the one above, are equipped on each side with two automatic ballast-feeding forks (below). Although only one N.Y.C. machine is so equipped now, the road plans to install the device on other units in the future



Big Machines R

• To put ballast tamping on a mass-production basis and thereby reduce the cost of this work in the face of rising wages for track labor, the New York Central System in 1947 placed in service 25 Pullman-Standard Power Ballasters. The purchase of these machines resulted from the road's experience with a single machine of this type which had been acquired in 1944. Since then all the machines have more than paid for themselves through direct savings in labor costs and have given the road the further benefits that go with greater speed and better quality of work.

Savings Being Realized

The Power Ballasters are saving an average of about $800 per mile of track as compared with previous methods of surfacing used. Production rates are averaging nearly a half mile of tamped track per day for each machine working. The quality of the finished work is such that stretches of track tamped three years ago by the Power Ballasters are reported still to have excellent riding qualities and to have required little or no maintenance in the meantime. In fact, it is believed that Power Ballaster—tamped heavy-traffic track

. . . New York Central. The heavy-lifting work in advance of the machine is accomplished by a Nordberg power jack, as shown above

Reduce Tamping Costs

On the New York Central System

For more than two years this road has had 26 Power Ballasters in operation. Through their use it reports that important economies, as well as other benefits, have been realized. Details concerning the operation of these machines and the savings being realized are presented in this article.

will hold up for five years before another out-of-face surfacing is required.

The Power Ballaster is an on-track self-propelled machine with eight tamping shoes which are given a pile-driver action by a 6200-lb. drophead extending across the track for the full length of a tie. The shoes are arranged in four pairs, one pair on each side of each rail. The shoes in each pair are located directly opposite each other. Each shoe is equipped with four removable tamping bars which may be varied in type as desired to suit any particular ballast condition.

How a Tie Is Tamped

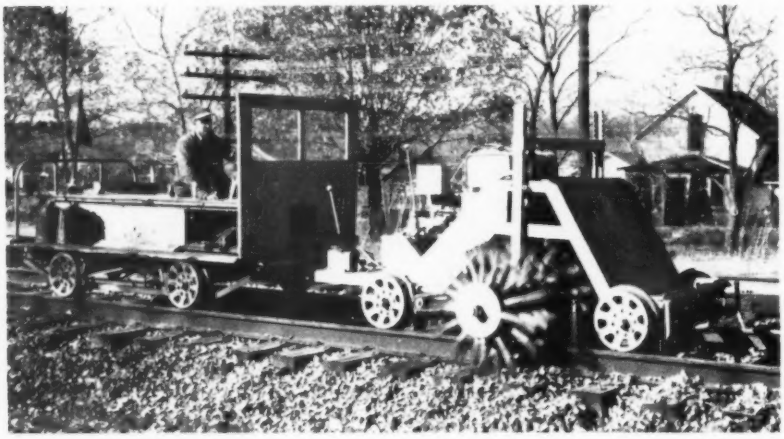
When tamping a particular tie the operator, looking through an opening in the floor, spots the machine in the proper position, applies the brakes, and sets the drophead into motion—all by air controls. Lugs on endless chains raise the drophead for a distance of 27 in., after which it is allowed to fall by gravity with an impact of 173,600 in.-lb. As the drophead falls, the tamper bars enter the ballast at about the middle of the crib. When the bars have penetrated to a point about 2 in. below the tie base, a cam and roller mechanism causes the force of the blow to be directed inward underneath the tie. All tamper bars follow the same path of travel; all penetrate to the same level; and all exert the same compacting force. The machine is equipped with power-operated jacks and power-driven transverse wheels which permit its removal from the track, when necessary, in three to five minutes.

Ballast tamping on the New York Central is carefully programed. At the beginning of each working season the Power Ballasters are distributed over the system to all locations on the program where the greater economies of mass production will be realized, i. e., where stretches of track 10 to 25 miles or more in length are to be surfaced out-of-face. However, no limit has been set in regard to the minimum length of track on which the Power Ballasters will be used. When available they are often used profitably on stretches of five miles or even less in length, particularly when speed is a factor, such as in surfacing a piece of rough track before frost sets in.

Detour System Used

In using the machines the New York Central has developed a number of more or less standard procedures designed to obtain the utmost in efficiency of operation. For one thing, in double-track territory, the detour system, in which traffic is routed around the work, is invariably used, thus eliminating delays due to train movements. For another, it is the practice to work the machines in pairs (sometimes in threes) under a single general foreman. Furthermore, where enough men are available, the machines are worked a double shift each day, gaining thereby as much as an hour of additional productive working time on each shift. When used in pairs it is generally the practice to start the machines back to back at the middle of the job and work them away from each other.

The New York Central's typical gang organization for tamping with a Power Ballaster consists of 31 men, including a foreman, two assistant foremen, the machine operator, a water carrier, a mechanic and two flagmen. When two machines are worked together, the work of both, as mentioned previously, is under the supervision of a general foreman. Also, one mechanic usually services both machines and one set of flagmen protects both. The other men in the gang are distributed throughout the raising, tamping and follow-up work.



This machine is used to sweep ballast from the ties behind the Power Ballasters

Use of Power Jack

Heavy track-lifting work in advance of a Power Ballaster is accomplished by a Nordberg power jack working about five rail lengths ahead of the tamping machine. The power jack lifts the track at each joint to a height slightly below the final grade. Small track jacks are then set on each side of the track just behind the power jack to hold the raise and, after the power jack has moved a half rail length ahead to repeat its operation, the track is raised to final grade by the small jacks. Other small jacks are then placed at the rail quarters.

About 40 Small Jacks Used

Raising the track to final grade with the small jacks seats them firmly and prevents settlement when the Power Ballaster moves over them tamping the ties. It is the practice on the New York Central to keep the raised track ahead of the machine always supported on about 40 jacks, 20 on each side. The road's experience is that this number provides an interval between the power jack and the Power Ballaster sufficient to permit the maximum of refinement in surface. As the machine passes the jacks, the latter are removed, carried ahead and distributed at the exact locations where they will next be used. The jacks are of the toe-lift type, and are placed to lift at the ends of the ties.

The raising operation as described in the foregoing requires the services of a foreman and assistant foreman, the latter sighting the track raise, and 13 men—one handling the level board, an operator for the power jack, one man digging jack holes ahead, eight men raising track and handling the small jacks, and two men carrying the jacks ahead from behind the machine.

Tamping the Track

The newer models of the Power Ballaster are equipped with two forks on each side of the machine which, coordinated with the movement of the drophead, automatically feed ballast to the tamping shoes. With these machines the need of hand feeding at the machine is eliminated; the only hand work required is occasional casting of ballast to the shoulder where the amount is insufficient to supply the automatic feed. At the present time only one machine on the New York Central is so equipped, and with each of the other 25 the actual tamping work requires five men—the Power Ballaster operator and four men who hand-feed ballast from the track shoulder to the cribs wherever more ballast is needed. However, the road plans to install the automatic-feeding mechanism on other machines as they are brought into the shop for general overhauling work.

Follow-up work behind each Power Ballaster consists of tamping ties at insulated joints and through switches, which is carried out by an assistant foreman and four men using a four-tool pneumatic tamping outfit, and adjusting rail anchors, which is done by two men. In addition the completed track is lined by a separate gang of 12 men.

Track Sweeping Machine

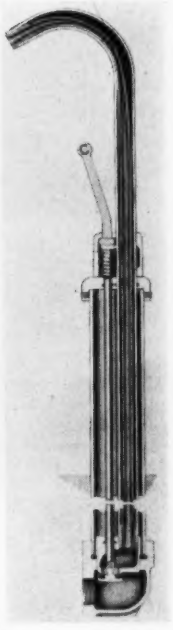
For sweeping ballast from the ties behind the Power Ballasters, the New York Central is using a novel machine, designed by J. C. Ryan, superintendent of maintenance equipment of the road's Lines West of Buffalo, and built by the road in its own shop. The machine consists of a cylinder, made of a section of hot water tank, which is suspended beneath a steel frame mounted on four flanged wheels. The surface of the cylinder is studded with welded lugs to which are fastened short lengths of used air hose, thus forming a cylindrical broom. The broom is rotated through a chain drive by a four-cylinder gasoline engine, and can be lifted to clear the rails or lowered to sweep the ties.

As the machine moves along the track at slow speed the rotating broom sweeps from the tops of the ties all ballast left there by the tamping operation. A number of these track sweepers are now in service. Two of them, the first ones built by the road, are pushed by motor cars when used in sweeping work. All later models, however, are self-propelled.

The Power Ballasters are operated on the New York Central System under the direction of J. H. Kelly, engineer maintenance of way, Lines Buffalo and East, and F. H. Simpson, engineer maintenance of way of the Lines West of Buffalo.

Self-Deicing Hydrants for Large Coach Yard

To conform with the regulations of the U. S. Public Health Service, one large railroad is installing Crane self-deicing sanitary hydrants for watering coaches at its largest coach yard. This article describes the hydrants in detail and discusses the benefits being realized.



Above—Newly installed Crane hydrant before application of quick type coupling to nozzle. Right—Cutaway view of the hydrant showing the inner rubber tube that prevents freezing

• One of the most vexing water-service problems on the railroads today is the provision of practical and economical coach-watering hydrants that will meet the rigid sanitary requirements of the U. S. Public Health Service and of the corresponding regulatory agencies of many states and cities. To solve this problem one large railroad, in addition to other types of hydrants, is making extensive use of a sanitary hydrant recently introduced by the Crane Company. This hydrant has no underground openings whereby contamination may enter, and in other respects has been found to conform to the sanitary requirements of various regulatory bodies. Furthermore, it is reported to be frostproof without the need of special insulation or heating coils. This particular road also considers that the hydrant is simple in construction and easy to install.

Perform Satisfactorily

Since last fall the road has installed 65 Crane hydrants at its principal coach yard and is in the process of installing 27 more at the same location. It has also installed these hydrants at other scattered locations on the system. The road reports that so far the hydrants have performed satisfactorily. No difficulties have been encountered at any location in getting the installations approved by the public health agencies. Also, the hydrants have operated satisfactorily in freezing weather. None of them, however, has been in service throughout a full winter. Consequently, their performance during protracted periods of extremely cold weather has not as yet been tested.

Rubber Tube Prevents Freezing

The key to the frostproof feature of the hydrant is a rubber tube placed under tension inside the riser pipe for its entire length from valve to outlet. When the water pressure is turned on, the rubber tube, carrying the water, expands against the inside of the riser pipe, allowing a full column of water to flow. As soon as the water pressure is turned off the rubber tubing contracts to an internal diameter about equal to the size of a lead pencil, squeezing all water out of the riser pipe except for a thin column which remains inside the tube. In cold weather this thin column of water may freeze down to the frost line. However, when the valve is opened the water flows up and around the "pencil" of ice, causing it to break up and flush out with the water, thus restoring a free-flowing stream almost instantaneously.

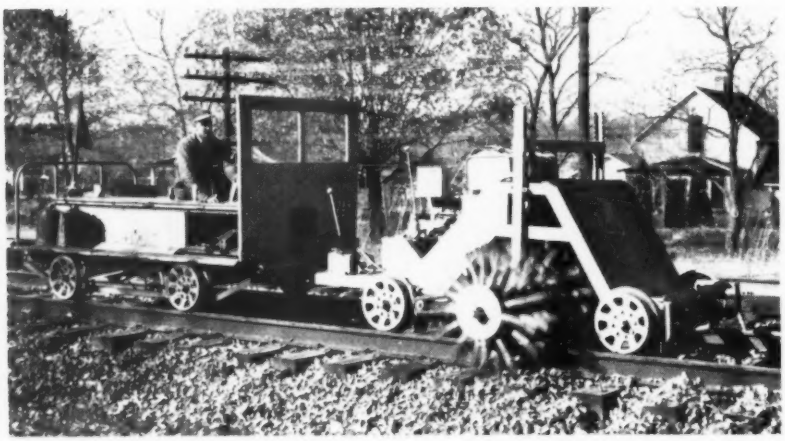
The effective life of the rubber tube under service conditions has not as yet been determined. The tube is wedged inside the riser pipe and if the tube becomes defective it is necessary to remove the entire riser pipe. This, however, is a simple job because the riser is fastened to the valve mechanism by a threaded connection and can be unscrewed and replaced in a matter of minutes without excavating the surrounding ground.

The valve of the hydrant is of the composition disc type, and is operated by a lever conveniently located on the stem of the hydrant. The lever has a cam at its lower end which thrusts the valve stem downward when the lever is moved forward. When the lever handle is released, spring action combined with water pressure returns the valve disc to its seat. Should it become necessary to replace the valve seat, the entire unit can be disassembled without digging up the hydrant.

Installing the Hydrants

The Crane hydrants installed at the coach yard mentioned above are 8 ft. 6 in. long. Each was placed with its valve mechanism 5 ft. below the top of rail and its spout 3 ft. 6 in. above this level. Installing the hydrants at this location was a relatively simple task. All that was necessary was to place the units upright in an excavated hole, connect them with a short piece of lead pipe to an existing supply line, and backfill. No underground pits, boxes or drainage lines are needed. The open ends of the hydrant spouts have standard pipe threads to which quick-type couplers were applied, as required by the public-health regulations.

The New York Central's typical gang organization for tamping with a Power Ballaster consists of 31 men, including a foreman, two assistant foremen, the machine operator, a water carrier, a mechanic and two flagmen. When two machines are worked together, the work of both, as mentioned previously, is under the supervision of a general foreman. Also, one mechanic usually services both machines and one set of flagmen protects both. The other men in the gang are distributed throughout the raising, tamping and follow-up work.



This machine is used to sweep ballast from the ties behind the Power Ballasters

Use of Power Jack

Heavy track-lifting work in advance of a Power Ballaster is accomplished by a Nordberg power jack working about five rail lengths ahead of the tamping machine. The power jack lifts the track at each joint to a height slightly below the final grade. Small track jacks are then set on each side of the track just behind the power jack to hold the raise and, after the power jack has moved a half rail length ahead to repeat its operation, the track is raised to final grade by the small jacks. Other small jacks are then placed at the rail quarters.

About 40 Small Jacks Used

Raising the track to final grade with the small jacks seats them firmly and prevents settlement when the Power Ballaster moves over them tamping the ties. It is the practice on the New York Central to keep the raised track ahead of the machine always supported on about 40 jacks, 20 on each side. The road's experience is that this number provides an interval between the power jack and the Power Ballaster sufficient to permit the maximum of refinement in surface. As the machine passes the jacks, the latter are removed, carried ahead and distributed at the exact locations where they will next be used. The jacks are of the toe-lift type, and are placed to lift at the ends of the ties.

The raising operation as described in the foregoing requires the services of a foreman and assistant foreman, the latter sighting the track raise, and 13 men—one handling the level board, an operator for the power jack, one man digging jack holes ahead, eight men raising track and handling the small jacks, and two men carrying the jacks ahead from behind the machine.

Tamping the Track

The newer models of the Power Ballaster are equipped with two forks on each side of the machine which, coordinated with the movement of the drophead, automatically feed ballast to the tamping shoes. With these machines the need of hand feeding at the machine is eliminated; the only hand work required is occasional casting of ballast to the shoulder where the amount is insufficient to supply the automatic feed. At the present time only one machine on the New York Central is so equipped, and with each of the other 25 the actual tamping work requires five men—the Power Ballaster operator and four men who hand-feed ballast from the track shoulder to the cribs wherever more ballast is needed. However, the road plans to install the automatic-feeding mechanism on other machines as they are brought into the shop for general overhauling work.

Follow-up work behind each Power Ballaster consists of tamping ties at insulated joints and through switches, which is carried out by an assistant foreman and four men using a four-tool pneumatic tamping outfit, and adjusting rail anchors, which is done by two men. In addition the completed track is lined by a separate gang of 12 men.

Track Sweeping Machine

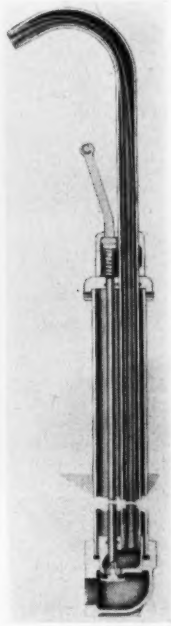
For sweeping ballast from the ties behind the Power Ballasters, the New York Central is using a novel machine, designed by J. C. Ryan, superintendent of maintenance equipment of the road's Lines West of Buffalo, and built by the road in its own shop. The machine consists of a cylinder, made of a section of hot water tank, which is suspended beneath a steel frame mounted on four flanged wheels. The surface of the cylinder is studded with welded lugs to which are fastened short lengths of used air hose, thus forming a cylindrical broom. The broom is rotated through a chain drive by a four-cylinder gasoline engine, and can be lifted to clear the rails or lowered to sweep the ties.

As the machine moves along the track at slow speed the rotating broom sweeps from the tops of the ties all ballast left there by the tamping operation. A number of these track sweepers are now in service. Two of them, the first ones built by the road, are pushed by motor cars when used in sweeping work. All later models, however, are self-propelled.

The Power Ballasters are operated on the New York Central System under the direction of J. H. Kelly, engineer maintenance of way, Lines Buffalo and East, and F. H. Simpson, engineer maintenance of way of the Lines West of Buffalo.

Self-Deicing Hydrants for Large Coach Yard

To conform with the regulations of the U. S. Public Health Service, one large railroad is installing Crane self-deicing sanitary hydrants for watering coaches at its largest coach yard. This article describes the hydrants in detail and discusses the benefits being realized.



Above—Newly installed Crane hydrant before application of quick type coupling to nozzle. Right—Cutaway view of the hydrant showing the inner rubber tube that prevents freezing

• One of the most vexing water-service problems on the railroads today is the provision of practical and economical coach-watering hydrants that will meet the rigid sanitary requirements of the U. S. Public Health Service and of the corresponding regulatory agencies of many states and cities. To solve this problem one large railroad, in addition to other types of hydrants, is making extensive use of a sanitary hydrant recently introduced by the Crane Company. This hydrant has no underground openings whereby contamination may enter, and in other respects has been found to conform to the sanitary requirements of various regulatory bodies. Furthermore, it is reported to be frostproof without the need of special insulation or heating coils. This particular road also considers that the hydrant is simple in construction and easy to install.

Perform Satisfactorily

Since last fall the road has installed 65 Crane hydrants at its principal coach yard and is in the process of installing 27 more at the same location. It has also installed these hydrants at other scattered locations on the system. The road reports that so far the hydrants have performed satisfactorily. No difficulties have been encountered at any location in getting the installations approved by the public health agencies. Also, the hydrants have operated satisfactorily in freezing weather. None of them, however, has been in service throughout a full winter. Consequently, their performance during protracted periods of extremely cold weather has not as yet been tested.

Rubber Tube Prevents Freezing

The key to the frostproof feature of the hydrant is a rubber tube placed under tension inside the riser pipe for its entire length from valve to outlet. When the water pressure is turned on, the rubber tube, carrying the water, expands against the inside of the riser pipe, allowing a full column of water to flow. As soon as the water pressure is turned off the rubber tubing contracts to an internal diameter about equal to the size of a lead pencil, squeezing all water out of the riser pipe except for a thin column which remains inside the tube. In cold weather this thin column of water may freeze down to the frost line. However, when the valve is opened the water flows up and around the "pencil" of ice, causing it to break up and flush out with the water, thus restoring a free-flowing stream almost instantaneously.

The effective life of the rubber tube under service conditions has not as yet been determined. The tube is wedged inside the riser pipe and if the tube becomes defective it is necessary to remove the entire riser pipe. This, however, is a simple job because the riser is fastened to the valve mechanism by a threaded connection and can be unscrewed and replaced in a matter of minutes without excavating the surrounding ground.

The valve of the hydrant is of the composition disc type, and is operated by a lever conveniently located on the stem of the hydrant. The lever has a cam at its lower end which thrusts the valve stem downward when the lever is moved forward. When the lever handle is released, spring action combined with water pressure returns the valve disc to its seat. Should it become necessary to replace the valve seat, the entire unit can be disassembled without digging up the hydrant.

Installing the Hydrants

The Crane hydrants installed at the coach yard mentioned above are 8 ft. 6 in. long. Each was placed with its valve mechanism 5 ft. below the top of rail and its spout 3 ft. 6 in. above this level. Installing the hydrants at this location was a relatively simple task. All that was necessary was to place the units upright in an excavated hole, connect them with a short piece of lead pipe to an existing supply line, and backfill. No underground pits, boxes or drainage lines are needed. The open ends of the hydrant spouts have standard pipe threads to which quick-type couplers were applied, as required by the public-health regulations.

Above—The Devil's River bridge after the work of raising it 15 ft. had been completed. The extent of the raise, as indicated by the amount of new concrete in the piers, is clearly evident. Right—Taken from the east side of the river, this view shows how the bridge appeared just after the erection of the four spans in the foreground had been completed, but before the work of raising the structure had been started. These spans had been washed out during flood of June, 1948. After this flood the trestle was built and later used as falsework in erecting trusses

Recurrent destructive floods in the Devil's river in Texas forced the Southern Pacific to take drastic measures to protect its truss bridge across this stream

By H. J. McKENZIE

Chief Engineer
Southern Pacific Lines in Texas and Louisiana, Houston, Tex.

• Within the last 17 years the Southern Pacific's bridge across the Devil's river in Texas, which had been a trouble-free crossing for 50 years, has been washed out twice by floods that rose high above the deck of the structure. Following the second of these floods, which occurred in 1948, it was decided to reconstruct the bridge at the original elevation and then raise it 15 ft. under traffic. To raise the bridge the spans were jacked up in 1-ft. increments, and supported on I-beam grillages. Concreting operations to raise the height of the piers followed closely behind the jacking work.

The Devil's river is probably the most infamous of all of Texas' famous rivers. It is approximately 100 mi. long and rises in the mountainous territory of West Texas, emptying into the Rio Grande at a point approximately 15 mi. west of Del Rio, Tex. The transcontinental main line of the Southern Pacific's Sunset Route crosses Devil's river approximately one mile above its mouth. The river has been rightfully named, as probably only the Devil himself would want to have much to do with it. From its upper reaches to the point where it empties into the Rio Grande, it flows through a rock-walled canyon with a solid rock bottom, and has a terrific rate of run-off. Heavy rains falling anywhere within its drainage area bring about rapid rises, with very little warning being given before the water reaches the Southern Pacific crossing.

First Big Flood

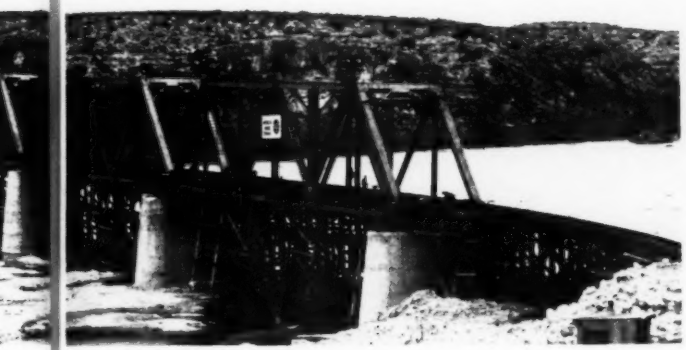
The Southern Pacific's main line was first constructed through West Texas and across Devil's river in 1882, and while there had been many floods in the years that followed, no great trouble was experienced at that point until September, 1932, when a 14-in. rain caused a severe flood during which the water reached a maximum height of 12 ft. above the top of rail on the five 150-ft. single-track truss spans which at that time formed the river crossing. These were supported on masonry piers built of native limestone. All of the spans were destroyed and the piers, in most instances, were broken off at least half the distance from the bridge seats to the foundations.

History Repeats—Too Soon

It was considered at that time that probably another such flood would not occur for at least a hundred years. Consequently the bridge was replaced on the same alignment and to the same elevation. However, new reinforced concrete piers of a rather massive design were constructed, all of which were anchored to the rock bottom of the river with heavy steel dowels.

After the bridge was replaced in 1932, no other trouble was experienced until June 24, 1948, when a flood, almost as great as the one in 1932, occurred. Records show that 24 in. of rain fell within a period of 14 hr. in this territory, although the rainfall was not exactly centered in the drainage basin of Devil's river. Ten inches of rain actually fell within this same period in the upper reaches

Long Bridge Raised 15 Ft. Under Traffic



Above—This dramatic view at one of the piers was taken at the time raising and concreting operations were in full swing

of Devil's river. When this flood reached the Southern Pacific crossing, it attained a height of 8 ft. above the top of rail and carried out all of the spans except the two on the west side of the river. It also washed out a 126-ft. approach trestle at the east end of the structure. The force of the water was terrific. It carried the spans downstream from three-fourths of a mile to a mile and crumpled the steel members as though they were made of wire. The piers, however, withstood the force of the flood; the bridge anchors were either sheared or broken off at the tops of the bridge seats.

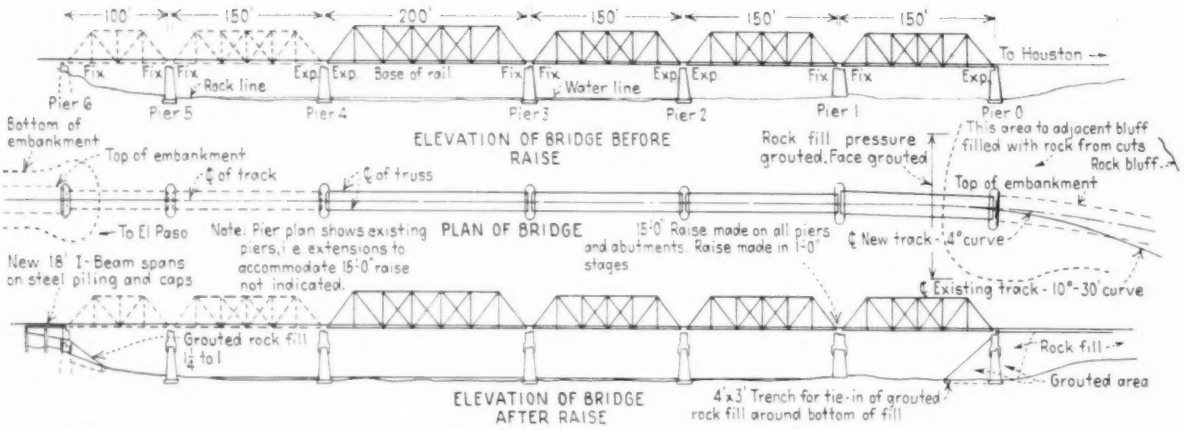
Inasmuch as there were no detour routes in the lower part of the state, making it necessary to carry rail traffic through Fort Worth and over to Sierra Blanca, Tex., it was imperative that temporary trestling be placed immediately for restoring the main line for operation. The temporary bridge was nearing completion on July 4 when another heavy rain of approximately 7 in. fell a few miles above the bridge and caused another serious flood which brought the water up to within about 10 ft. of the top of the rail on the bridge. The temporary trestling was constructed on the rock bed of the river and, while well braced and anchored at the bottom by steel dowels extending into the rock, it did not have enough lateral stability to withstand the terrific force of the water carrying heavy drift. Even though loaded ballast cars were placed on the bridge, it washed out again that afternoon before the line was even opened to traffic. The ballast cars were scattered downstream over a distance of 1½ mi. Temporary trestling was again built and the first train passed over the bridge at 4:00 p. m. on July 9.

Curvature Reduced

Numerous plans were then considered for replacing the old bridge but the most economical and practical was one involving the replacing of the spans on the same alignment at their old elevation, with the objective of later raising them a height of 15 ft. under traffic. It was possible to do this because the old piers were of sufficient strength and size to permit extending them an additional 15 ft. in height. Cost studies showed this to be by far the most practical plan. In replacing the east span, which was formerly on a 10-deg. curve, it was decided that a line change could be made, reducing this curve to 4 deg., thus permitting an increase in speed from 30 m.p.h. to a maximum of 50 m.p.h. The line change involved the construction of approximately a mile of additional track on the east approach having a maximum curvature of 4 deg. and a maximum compensated grade of 1 per cent. This work required considerable grading, which was done under contract by Allhands & Briley, Dallas, Tex.

Erection Work Begun

The new steel spans were ordered from the American Bridge Company in July, 1948, and delivery was obtained in the latter part of December. American Bridge Company forces commenced the erection work the early part of January and completed placing the spans to the original base-of-rail grade on March 4, 1949. Immediately after the steel-erection work had been completed, the railroad's forces began the removal of the timber trestle which had served as a temporary crossing and also as falsework during the erection of the new spans. This



Plan and elevations of the bridge before and after it was raised. Spans shown by dashed lines were the only ones not washed out in the flood of June, 1948. Others were replaced before the raising operation was started

work was completed April 1 and the raising operations were begun immediately.

How the Bridge Was Raised

The work of raising the bridge was undertaken with railroad forces. The plan of making the raise involved the use of 12-in., 31-lb. I-beam grillages, with the objective of raising the bridge in 1-ft. increments at each pier between trains. Two bridge gangs comprising a total of 40 men were assigned to the job. Duff-Norton 100-ton manual jacks were used. The raising operation was commenced at the west end of the bridge on Pier 6, which was raised 1 ft.; then a raise of 1 ft. was made on Piers 5 and 4. The jacks were then moved back to Pier 6 and this point was raised an additional foot; then Pier 5 was raised another foot, after which Pier 6 was raised another foot, making a total raise of 3 ft. on Pier 6.

The jacks were then moved to Pier 3, where an initial 1-ft. raise was made, then an additional 1-ft. raise was made on Piers 4 and 5, bringing Pier 5 to a total height of 3 ft. and Pier 4 to a height of 2 ft. This operation was continued throughout the length of the bridge, maintaining a run-off so that the difference in elevation between any two consecutive piers was not greater than 1 ft. at any time. As soon as Pier 6 had been raised 3 ft., form building and concreting operations were started on that pier, with the concrete being poured to a height of 2 ft. 6 in. above the old pier. The concreting operation was carried out on the other piers as quickly as possible, this work following closely behind the raising operation.

After the entire structure had been raised 3 ft., the raising operation was again started on Pier 6 at the west end of the bridge and proceeded as in the first instance, continuing through the length of the structure with another 3-ft. raise. At piers on which concrete had been poured, seven days were allowed for setting before any further jacking operation took place. Following the first 2-ft. 6-in. pour throughout the length of the bridge, the second pour was reduced to 2 ft. in order to allow sufficient room for placing the jacks in making the following raise.

Wood Mats Prevent Slippage

As the bridge was raised, wood blocking was used under the shoes as a safety measure in case of jack failures and, as soon as the bridge had been raised 1 ft., the blocking was removed and a steel I-beam grillage was placed under the shoes. The bridge was then raised an additional 2 in. to allow the placing of a 2-in. wood mat between each shoe and the grillage to prevent the shoe from slipping on the grillage. This was necessary because it was not practical to maintain anchor bolts through the grillage and shoes during the jacking operation.

In jacking at each pier the jacks were placed between the top of the pier and the bottoms of the end floorbeams, on which stiffener angles had been applied to prevent the buckling of the floorbeams. As the bridge was raised, the grillage provided for placing under the jacks was added. In addition to this grillage, steel shims, consisting of plates welded together and I-beams of various dimensions less than 12 in., were fabricated in the field and were used under the jacks until sufficient raise had been made for placing the permanent grillages under the jacks.

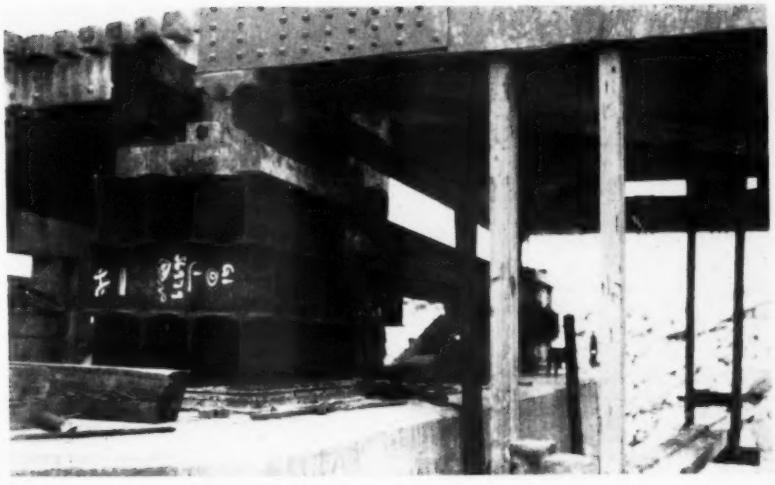
At the beginning of the jacking operation, hardwood blocking was found to be impracticable for use under the jacks. The reason was the frequency of use and the crushing of the blocking under the heavy loads. Consequently such blocking was discarded in favor of the metal shims.

Construction joints were made in the concrete at the midpoint of the 12-in. grillages for the reason that this would assure a stronger bond than if these joints were made in the same location as the joints between the series of grillages.

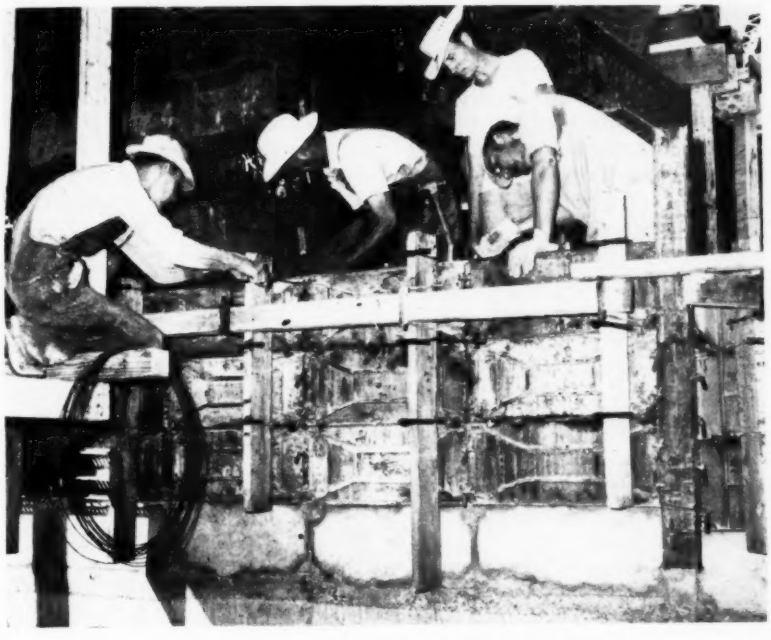
No Serious Difficulties

After two 3-ft. raises had been made throughout the length of the structure, the raise was reduced to a maximum of 2 ft. and the top of the concrete was brought up to a level 1 ft. 6 in. below the tops of the grillages, which made a maximum of 3 ft. 6 in. of grillage above the concrete at any one time. Two 3-ft. raises and four 2-ft. raises were made, leaving a final raise of only 1 ft. to bring the bridge to grade. No serious difficulty was encountered with the spans getting out of line or moving longitudinally. Some movement was ex-

Right—The bridge was raised in increments of 1 ft. and supported on I-beam grillages. This view was taken after a pier raise of 3 ft. had been made, but before the concrete work got underway



Below—Removable steel forms were used for the concrete work. In this view the forms are being wired in position around a grillage in preparation for pouring another section of concrete



perienced, but it was not sufficient to require that the spans be returned to the original location until after the final raise was made. At that time the spans were placed back on the center-line and jacked longitudinally to their proper location on the piers. The work of raising the bridge was started in April, 1948, and completed in August.

Metal Forms Used

Metal forms provided by Economy Forms Corporation were used on all the piers and proved to be very satisfactory. The moving of these forms was much faster than would have been possible with wood forms, and their use expedited the job considerably.

Eight hold-down bolts were provided on each of the intermediate piers, and four on the end piers. These bolts were fastened to the floorbeams by means of a bracket through which the bolts passed, with the nuts on the top of the bracket. The bolts were extended by welding as the bridge was raised so that they were effective at all time.

The Concreting Work

The concrete was mixed in portions of 1: 2½: 3½, and 1 lb. of Pozzolith per sack of cement was added. Sharp Colorado River sand and crushed trap rock were used as aggregates. Two concrete mixers were used, one located at each end of the bridge. Concrete was carried from the mixers to the various piers in a Blaw-Knox drop-bottom concrete bucket which was transported by track crane. Metal pipes were used to place the concrete below the deck of the bridge where the bucket could not be lowered sufficiently to eliminate the dropping of the concrete. A pneumatic vibrator was used in "puddling" the concrete and working it into the grillages under the shoes.

Grouting Rock Fill

A rock fill placed around Pier "O"—the east pier of the structure—was pressure-grouted by the Better Welding Company to solidify the mass and prevent scouring on the river side of the pier during high water, and to decrease the overturning pressure on the bank-side of the pier. To facilitate a better distribution of grout in the mass, two-inch pipes for grouting were placed around the pier before the rock fill was made.

At the west end of the bridge, to relieve the pressure of the fill against Pier 6 due to the increased height, two 18-ft. I-beam spans were added. These spans were placed on H-beam foundation piles, four per bent, which were driven to solid rock at 50 ft. below the base of rail. No difficulty was encountered in driving these piles through the original 10-ft. rock fill and boulder bed. A Vulcan No. 30-C steam hammer was used in this work.

F. S. Schwinn

The Railroader's Pursuit of Happiness

By F. S. SCHWINN
President, American Railway Engineering Association
and Assistant Chief Engineer, Missouri Pacific Lines
Houston, Tex.

• There could be no worthier subject for discussion at your Engineering Night* than ways and means to insure the railroader's continued freedom to pursue happiness. Such is guaranteed by the Constitution of the United States, and that right should be jealously guarded by the railroads and every American railroader.

We have heard much of the Four Freedoms. I like to think that all of the possible good in those freedoms may be identified in the freedom of individualism and opportunity. It was that kind of freedom which pushed the railheads ever onward until they extended from the Atlantic to the Pacific, from the Canadian border to the Gulf of Mexico. It required individualists, rugged pioneering individualists, led by equally rugged engineers, to develop and expand our railways from their beginning in 1830 to the present network of 225,000 mi.—a mileage equal to 30 per cent of the world's total. And with those individualists went other individualists who developed the farms and the mines, the great cattle industry, and the lumber industry. These were followed by still others who developed the textile industry, the steel industry, the petroleum industry, the automotive industry, the chemical industry, and many other basic as well as allied interests.

It required individualism and opportunity to initiate and extend this growth. It was a rapid growth that took the handful of small colonies and forged them into a mighty nation of over 150 million free men since the adoption of the Declaration of Independence by the Continental Congress in 1776. That growth was inspired by individualism, it was fostered by opportunity, and it was spark-plugged by your railways as they sensed and pioneered the opportunities.

Must Pursue Happiness

And where did this American individualism and opportunity spring from? It came out of that same Declaration of Independence and was embodied in three simple words. Those words were "pursuit of happiness." The Declaration of Independence specifies three God-given rights—life, liberty and the pursuit of happiness. It does not designate happiness, as such, as one of the rights. It clearly refers to the **pursuit** of happiness as the right of all men. That is your guarantee and my guarantee. We have not been promised happiness. We have been given the right to work for it, the right to pursue it and grasp it, and the right to fight for it, if fighting be necessary.

But we now find many who believe that happiness is something their federal government should give to them in one form or another. There are those who believe the happiness derived from an assured security in old age is something they need not pursue or work for—that it should be provided by the federal government. There are others who expect their undertakings to succeed, not because they are able to develop success by legitimate pursuits, but because they look to government for subsidies to absorb costs they are unable to meet. Still others would have the federal government give them electric power, irrigation, medical service, an assured profit from farming, and many other items of happiness, merely for the asking. Is this because they do not know the worth of freedom and would pawn it to obtain a semblance of happiness, instead of pursuing happiness as contemplated by John Adams, Roger Sherman and the other patriots who helped draft the Declaration of Independence?

Railways Ask No Favors

Your railways have asked for no governmental assistance and ask for none now. They received no part of the near billion dollars in federal aid given other forms of transportation in 1948, and the probably more than that given in 1949. They have asked only for the fair treatment to which they are entitled and have so deservedly earned throughout the years, and particularly during the late war.

And in their request for such fair treatment they have included relaxation of unnecessary regulation, a halt to the imposition of added and equally unnecessary regulation, and the combining of governmentally assumed responsibilities for costs with those assumed for controlling revenues.

Costs and Taxes

The railroads have repeatedly cautioned against the imposition of costs and taxes without regard to their ability to pay, costs which would ultimately price them out of the transportation market. They have asked that railway managements be permitted to manage.

*An annual feature of the club's yearly program.

But in these pleadings for fair treatment, they find themselves very near to being alone. Business and industry as a whole have failed to support the very agency that has made their own success possible. Blindly and selfishly they follow the lure of today, without opening their eyes to the dangers of the morrow. They refuse to concede that their future welfare is tied to that of the railways, now, just as it has been in the past.

(At this point Mr. Schwinn told of the expansion of rail lines in Texas, and then presented statistics to show the concurrent rapid expansion of farming, forestry and industry within the state. Then, continuing, he said in part as follows):

Why do I interject these statistics? Because they highlight the results of individualism, of initiative, of toil and planning, and finally, of the pursuit of happiness—the American way of life. They typify the growth that may be possible under the freedom of opportunity guaranteed by a government of the people, by the people and for the people.

What's Ahead?

But what of the future? Can the railways continue to develop? Can they continue to give our country the highly efficient service they have provided through more than a century of effort? The railways have been outstanding leaders in the pursuit of happiness. As an industry they have carried with them all other basic industries in their successful realization of the opportunities afforded by our freedom. Is such an industry soon to be deprived of the rights of private enterprise? Shall the railway industry be denied the right to attract new capital because its costs of operation and maintenance are increased to the point where it can no longer earn even the semblance of a fair return upon its investment? Is it to be denied the right to pursue happiness by being subjected to taxation for the support of its competitors—the highways, the waterways and the airways?

When the railway industry can no longer lead in the growth and development of our country it will be for the reason that the constitutional guarantees of individualism, opportunity, and freedom have been displaced by a shackled regimentation under a socialistic order. The American people do not want a socialized railway industry, but thus far have failed to recognize the devious and sinister activities designed to force such a condition.

Public Must Be Told

The American public must be told in understandable terms what the nationalization of our railways may mean, for they can rest assured that, just as our railways, under free enterprise, lead in pioneering and in preparing the way for other industry, just so, under socialism, they would lead on the downward path. They would be followed quickly by the entire transportation industry, by steel, coal, power, banks, the automotive industry, the textile industry, the petroleum industry and many others. The American people do not want the evils of socialism, but they are doing too little successfully to combat its threat to their country.

This is an abstract of a challenging address by Mr. Schwinn before a meeting of the New England Railroad Club, at Boston, Mass., on December 13. In it he tells of the remarkable growth of the railways—and the country—under the American way of life; warns against the evils of socialism; and calls upon railroad men to guard jealously their God-given, Constitution-affirmed rights of life, liberty and the pursuit of happiness.

Good men differ greatly in their definitions of a republic and a democracy. But that is unimportant. The important thing is the future of our railways, the future of American industry, the future of our nation, and that we keep it always a republic. It is important that all men insist on the observance of the Constitution; that they insist upon their God-given rights to life, liberty and the pursuit of happiness; and that they loudly proclaim their love of American freedom and their belief in the American way of life. As railroad men, it is up to you to do just that.

What Individuals Should Do

As individuals, what can you do? You can talk, not occasionally, but frequently, not mildly or apologetically, but noisily and forcefully. You can talk to the members of your family, your fellow railroaders, your friends and neighbors. Talk at your lodge, your club, your luncheon table and at your church meetings. Talk to your fellow commuter in the bus and on the train. Talk to your butcher, your baker, your grocer, your tailor—yes, even to your haberdasher.

Talk in the interest of our industry. Tell the businessmen, the shippers and the manufacturers along your lines the full truth and outline the consequences to them if that truth is not heeded. In the final analysis, it is within the power of business and industry to choose between private enterprise and a socialistic state. Ask them to give voice to their choice, and not mumble.

All this must be done at the same time that you carefully consider your operations and practices, and correct or remove any weaknesses or shortcomings that may be present. Then act as you talk, and encourage others to act likewise. Do not be discouraged should you be labeled a prophet of ruin.

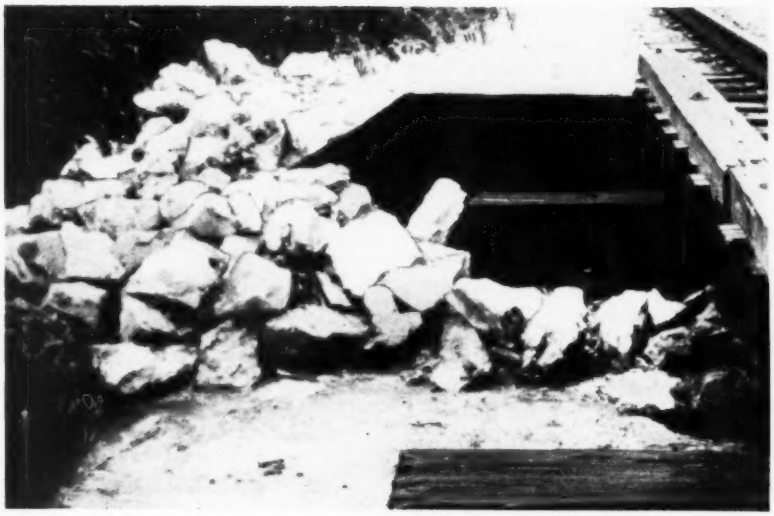
Fight for the Republic

You have been very busy looking after the many responsibilities attached to your respective jobs and may have overlooked your even greater responsibility—the responsibility of preserving the Constitution and our American way of life. If you have, do not neglect it longer. Be you a Democrat or a Republican, be first an American who will fight for Americanism and against socialism in all its forms—particularly in the form of centralization of control and power. Be one who will fight for his Republic to keep it.

The American railroader has every reason to guard jealously his three rights, and not the least of these rights is the "**pursuit** of happiness." May he guard those rights aggressively.

In this article the author tells how this work is being done on the Missouri Pacific Lines in Texas and Louisiana—through the application of a concentrated borate ore—which is not only proving more effective than hand shovel-cutting to minimize the hazard of fires, but also much more economical.

By LEE MAYFIELD
Resident Engineer
Missouri Pacific Lines in Texas & Louisiana, Houston, Texas



This side of trestle, treated with borate 6 months ago, is clear of weeds, while . . .

Solving the Weed Problem A

• The Missouri Pacific Lines in Texas & Louisiana are making important strides in their battle against weed growth around and about timber trestles — a battle that has necessarily been waged almost constantly along main-line and branch-like structures to minimize the hazard of fire from ground sources. These strides are being made by the surface application of concentrated borate ore to the areas involved—a treatment that is not only proving more effective—and lasting—than shovel cutting, or hand scalping, but which is resulting in savings of as much as $1.66 per lineal foot of trestle per year for this class of work.

The problem on our lines with heavy vegetation growth about timber trestles is one that has been shared by many roads, particularly in the southern part of the country, and for years has been fought in much the same way as on other roads—with repeated shovel or hand scalping. Where surface conditions would permit—which is limited—power machines, such as graders and bulldozers have been used for this work, but even in such instances the vegetation around piling has had to be removed by hand methods.

Our problem at trestles has been occasioned largely by the growth of Johnson grass, Dallas grass, nut grass, Bermuda grass; certain types of weeds, such as thistle, dandelion and wild verbena; and vines such as cowitch and catclaw. In most areas these growths have required shovel scalping three to five times a year to maintain fire-safe conditions about our structures—at a constantly increasing labor cost. In 1948 the annual cost of maintaining a satisfactory condition, by hand methods, varied from 96 cents to $1.60, or an average of $1.28, per lineal foot of trestle. And the average was somewhat higher where gravel or rocky surfaces were encountered.

Method of Application

During 1948, in an attempt to lower these costs, and to produce more effective—and permanent—results, if possible, we applied a concentrated borate ore under and around five trestles as an experiment. The results were so gratifying that during 1949 we made a rather extensive test of this material, applying it to all the timber trestles (26,600 lin. ft.) on a territory approximating 250 mi. in length.

The material was applied by hand, in accordance with the suppliers' recommendation of approximately 12 lb. per 100 sq. ft. The application was spread over a width of 50 ft.—that is, 25 ft. each side of the center line of the structure. The approaches of all trestles, for a distance of 15 ft. from the ends, were also treated, the treatment extending out for 25 ft. on each side of center line. This provided a cleaned area at least 15 ft. from the nearest pile or timber.

To do this work effectively and economically, each section foreman was furnished a statement showing the amount of material required for each structure on his section. The material was purchased in carload quantities, sacked in 100-lb. bags, and the required amount was delivered to the section forces, at their headquarters, at the time they were ready to make application.

The material was transported from section headquarters to trestle sites by section motor car and trailer cars. Two section gangs of three laborers each worked together making the application. One of these gangs, in each case, either had been instructed in the proper method of application, or nad worked with another gang which had learned the method of application.

Upon arrival at a trestle one of the foremen would lay off the area to be treated, while the laborers filled ordinary 12-qt. water pails with the material. These pails, when level full, held 21 lb. Four pails full, or 84 lb., were used per trestle panel of 14 ft. Two laborers on each side worked from the outside toward the center line of the

. . . this side, untreated, is badly overrun with Johnson, Bermuda and Dallas grass

m About Timber Trestles

trestle, completing a panel at a time. While these four men were making the application, the other two men were filling and carrying other pails. Each man soon learned to spread the material uniformly over his area without backtracking.

The material was applied during February and early March in order to take advantage of the better dissolving action of the slow winter rains, rather than lose a large portion with surface runoff during heavy spring rains. This was also done to discourage early spring growth of vegetation.

Costs and Results

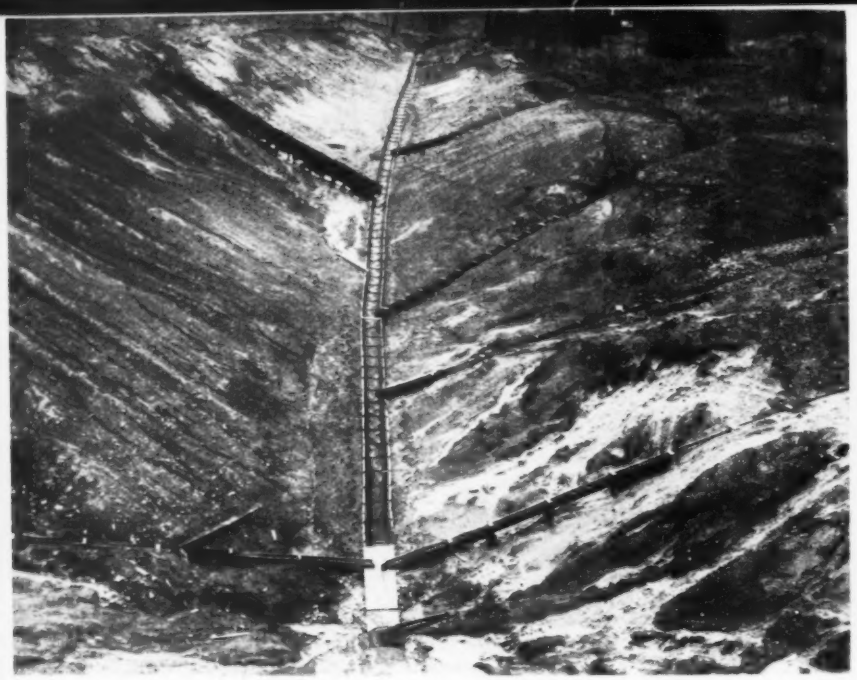
Converted to present labor rates and prices, the cost of the concentrated borate ore treatment averaged 19.2 cents per lineal foot of trestle, of which 18 per cent was for labor and 82 per cent was for material. Comparing this with a cost (at present labor rates) of $1.11 per foot for three hand scalpings, or of $1.85 per foot for five hand scalpings, yearly, shows savings of 92 cents in the one case, and $1.66 in the other, or an average saving of $1.29 per lin. ft. per year in favor of the chemical treatment.

Generally, the results of this treatment have been very good and regrowth of vegetation has been poor and spotted. Where the application was made to sharply sloping surfaces and was followed by heavy rains, a considerable part of the material was washed off and the results were less satisfactory. Also, before the section forces learned how to scatter the material, there were some spots where the application apparently did not cover the surface uniformly, and the results were short of expectations. As to the kinds of vegetation itself, very good results were obtained in Johnson grass, Dallas grass, and weeds such as thistle, dandelion and wild verbena. Slightly less effective results were secured on Bermuda grass. Nut grass and vines like cowitch and catclaw were not killed by the application of 12 lb. of the material per 100 sq. ft. However, at only a few locations was the growth or regrowth sufficient to consider it a fire hazard, and at these locations a small amount of hand scalping was required.

We expect to extend the borate ore treatment to other main-line and branch-line timber trestles in 1950, and the program will include retreatment of all of the structures treated in 1949, except two of the five structures treated originally in 1948, which were retreated in the 1949 work. It is expected that the second treatment with concentrated borate ore in 1950 will show much better results than the single treatment in 1949. This expectation is based on the results secured around the two trestles retreated in 1949, where vegetation in the treated areas was practically eliminated. From this experience we are hopeful that applying the treatment to areas for two successive years will so condition the ground that treatment in the third year can be skipped. If this is found to be the case, the cost of treatment will be reduced by one-third over a period of three years.

Use of the concentrated borate ore treatment on the Missouri Pacific Lines in Texas & Louisiana has been under the general direction of C. S. Kirkpatrick, chief engineer, and under the immediate supervision of the division track forces.

Borate is delivered in 100-lb. bags and is distributed by hand from 12-qt. pails



Upstream view of the ravine, showing the flume system that directs water to . . . . . this 52-in. culvert through embankment

Hard Work, Intercepting Ditches and T

• The Erie recently completed a major fill-stabilization project at a point known as Station 148 on its River line, in western New York, where, for a period of 40 years, considerable difficulty had been experienced with gradual subsidence of the embankment, requiring that the track be raised two to three feet every year. The stabilization measures employed included the excavation of about 75,000 cu. yd. of material that had been deposited many years ago in a ravine on the upstream side of the fill. The purpose was to lower the flow line of the stream in the ravine to its original level and to install intercepting ditches parallel to and on the upstream side of the track at the original ground level and carry the stream and intercepted spring waters in a new 52-in. Multi-plate pipe tunnelled through the fill at the original level of the stream bed. A system of timber flumes was constructed to collect water from numerous sub-surface springs on the sides of the ravine and carry it to a main flume, made of 36-in., half-round corrugated pipe, leading into the culvert.

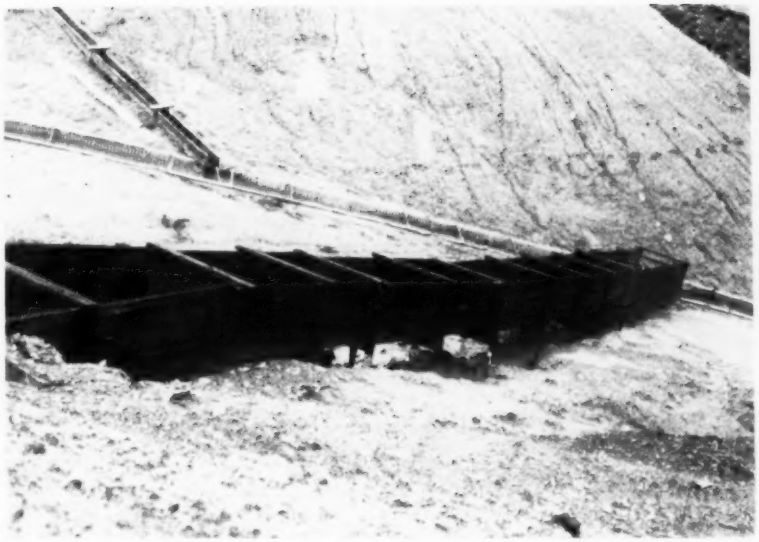
The earlier phases of this project, which included the installation of the culvert and the lowering of the stream to its original level, were completed in 1946. Previous investigation had developed the existence of sub-surface springs. A deep intercepting ditch, parallel with the track at the original ground level, was completed in the early fall of 1948. Continuous and heavy-flowing springs were uncovered during the excavation. These springs tended to erode the sides of the ditch. Therefore, a system of timber flumes was installed to lead water to the main ditch without erosion. Since that time no trouble has been experienced with the fill.

The River line of the Erie forms part of the Allegheny division and extends from River Junction, N. Y., 27.8 mi. west of Hornell, on the line from Hornell to Buffalo, a distance of 32.6 mi. to Cuba Junction, on the Erie's main line from New York to Chicago. Cuba Junction is 52.6 west of Hornell. The River line was built in 1908 to provide a single-track low-grade freight route, avoiding heavy main-line grades between Hornell and Cuba Junction.

In much of the territory traversed by the River line, the subgrade is composed largely of a yellow clay that becomes highly plastic when wet. In the vicinity of River Junction the track passes through a number of cuts of varying depth, the side slopes of which are of this material. Here, during periods of wet weather, considerable difficulty is experienced by the track forces in keeping the side ditches open because of the tendency of the clay material to flow.

At a point 2.6 mi. west of River Junction, known as Station 148, the line extends over a fill, approximately 90 ft. high and 900 ft. long, which crosses a steep-sided ravine. The material in this fill consists, for the most part, of the yellow clay already mentioned, and, presumably, was taken from a deep cut directly to the west.

When the fill was built, construction plans called for a 6-ft. by 6 ft. concrete box culvert to be located at the original ground level, to carry off all the water from the ravine. The culvert was built according to plan, but a slide occurred during the construction of the embankment and the culvert was lost. It was then decided to construct a 36-in. pipe culvert, approximately 45 ft. above the original ground level, at a point 250 ft. west of the original box culvert. This required that the flow line of the stream on the



Showing construction of one of the larger treated-timber flumes

For many years the Erie has experienced difficulty with an unstable fill over a steep ravine on its River line in western New York. After much excavation and heavy work, which included the installation of 452 ft. of 52-in. Multi-plate pipe culvert through the fill by tunneling, a system of deep ditches to intercept sub-surface springs on both sides of the ravine upstream side from the fill was constructed to prevent water from flowing into the embankment.

nd Timber Flumes

SOLVE SLIDE PROBLEM

Nearly 75,000 cu. yd. of material were removed from ravine in lowering the main stream channel to its original level, after which 383 ft. of 36-in. half-round corrugated pipe was installed as a flume

upstream side of the embankment be raised by filling in the ravine, and a ditch was made in the new fill to lead the water to the new culvert. The filling material used in this work, presumably, was waste excavation from nearby cuts, and, like that used in the railroad embankment, was predominately yellow clay. Thus, the raised stream flowed across filled ground for a distance of nearly 600 ft.

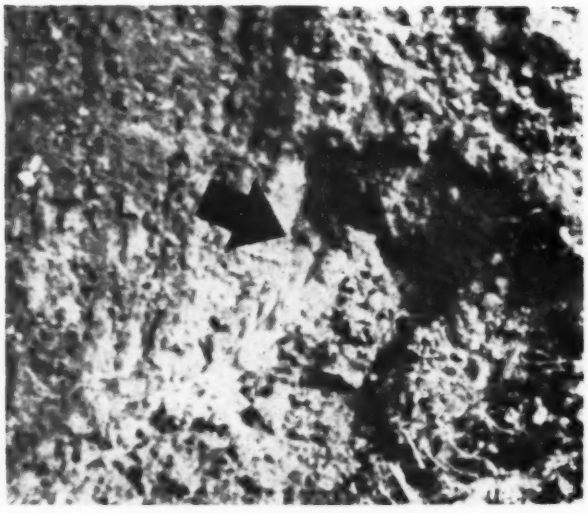
The reasons for adopting this plan are not known. The result, however, produced a long history of slides and subsidence, due to some water running through the base of the fill in the original stream bed and to the formation of water pockets in the yellow clay fill, requiring that the track be given almost constant attention, surfacing it at least once or twice a week and after every rainy period. Further, the track frequently went out of line toward the downstream, or north, side, and required much work to restore it to proper alignment.

On May 3, 1929, a serious slide occurred near the west end of the fill, a section about 200 ft. in length going out to a depth of nearly 50 ft. This slide occurred under traffic and a locomotive was overturned down the embankment.

A number of measures were employed at various times in attempts to stabilize the fill. These included the installation of additional culverts near each end of the fill, the installation of sub-surface drains to direct water to the culverts, and the tapping and draining of water pockets on the downstream side of the fill. While of some benefit, these measures were far from successful, and the settlement continued over most of the fill, with the greatest subsidence taking place in the west 600 ft., where it was necessary to raise the track two to three feet each year.

In 1946 it was decided to restore the bed of the stream to its original level by excavating a channel in the filled ground upstream from the railroad embankment, and then to install a new culvert, consisting of 452 ft. of 52-in. Armco Multi-plate pipe, through the base of the embankment, near the location of the original concrete culvert.

The initial phase of this work was the installation of the pipe by tunneling through the embankment. This proved to be difficult because of the muddy condition that prevailed and because sections of the old concrete box culvert and water pockets were encountered at several points. On several occasions, soft clay and large quantities of water flowed



Above—A considerable amount of excavating was necessary in some cases to uncover the sub-surface water sources on west side of the ravine

Left — A close-up view of one of the constantly - flowing springs uncovered at the west side of the ravine during the excavation

into and partly filled the new pipe. This work was done by the construction department of the Armco Drainage & Metal Products Co. The pipe placed is of multiple sections of 7-gage, galvanized steel, coated and bonded, the sections being bolted together in the tunnel. This work was begun on August 15, 1946, and was completed on December 17, 1946.

Excavation to lower the stream bed to its original level began at about the same time the culvert work was started. Railroad forces were used in this work, employing two crawler cranes each with a ¾-yd. drag-line bucket. These units cast the excavated material to two Caterpillar bulldozers which leveled it at suitable points. Later, when the ground was sufficiently dry, four 3-cu. yd. dump trucks were used to haul the material to a disposal point on the downstream side of the fill, where it was spread by a bulldozer. Nearly 75,000 cu. yd. of excavation were made in this work. When the new stream channel was completed, 383 ft. of 36-in. Armco half-round corrugated pipe was installed therein as a flume to lead the water directly to the culvert, and prevent it from finding its way into the railroad embankment.

The sides of the ravine, particularly the west side, contained a number of water sources which were uncovered during excavation, some being wet-weather springs, while others were springs which flowed constantly. Many of these springs were found to be two or three feet underground. It was reasoned that water from these sources was finding its way underground, through the filled ground and into the railroad embankment. To this water was added the surface water which seeped into the filled ground after every rain.

Eight Sources of Water

A study of this situation established that there were eight principal sources of water in addition to the main stream. Each of these, in general, was composed of a group of small springs. The greater number of the water sources were found on the west bank of the ravine and, of these, nearly all run constantly. Those on the east bank were, for the most part, found to run only in wet weather.

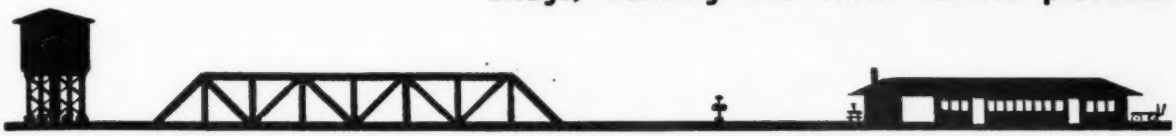
To intercept as much of this water as possible at the source, and keep it from entering the railway fill, the longitudinal intercepting ditches parallel with the track were constructed. A system of treated-timber flumes was constructed, leading to the half-round pipe in the main stream bed to prevent erosion of the sides of these ditches. These flumes vary in size from 8 in. by 10 in. to 2 ft. by 3 ft., depending on the quantity of water involved, and in length from 20 ft. to 123 ft. Short trenches were dug to lead water from the springs to the flumes. Some additional flumes were installed on each side of the ravine to catch storm water from gullies and prevent it from eroding sides of slopes.

The installation of the intercepting ditches, after first lowering the stream bed to its original level, has been highly effective in drying out the railroad embankment. Since this project was completed last October, settlement in the embankment has been negligible, even after heavy rains. Furthermore, the track has required very little attention, releasing the section forces for other important work. It is believed that the fill will become completely stable in due time.

The roadbed stabilization measures described were carried out under the general direction of Blair Blowers, chief engineer maintenance of way of the Erie, Cleveland, Ohio, and H. J. Weccheider, engineer maintenance of way, Youngstown, Ohio. Direct supervision of the work was by L. Rossman, division engineer of the Allegheny division, Salamanca, N. Y., and his assistant, J. P. Morrissey.

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Outlining Daily Work of Foreman

To what extent should roadmasters and supervisors attempt to plan in detail the daily operations of their section and extra-gang foreman? What are the factors involved?

Don't Destroy Initiative

By O. H. CARPENTER
General Roadmaster, Union Pacific, Pocatello, Idaho

This question is one that is worthy of very careful consideration by every supervisor. Some of the factors involved are serious in that, if too close and detailed supervision is given every operation of track foremen they will lose their initiative and become nothing more than leading workmen, doing only the tasks outlined by their supervisor without attempting to find work that might require their own resourcefulness. This also has the adverse effect that when the gang has completed an item of work outlined by the supervisor, there will probably be very little work done until the supervisor can return and outline more work. In case he is detained elsewhere, this could amount to considerable loss of production.

On the other hand, where forces are short and each gang must do as much work as possible every day, it helps a foreman to be told where his most serious conditions exist. By having someone else point out the spots needing immediate attention the foreman can do more work than if he has to find them himself. Where there are numerous jobs that require attention, particularly in the case of line or surface, the supervisor, by riding trains frequently, knows best where work is most required to provide safe operation at normal speed, and by lining up his foremen to work on such places can eliminate the necessity for slow orders and improve the performance of track gangs. During periods of force shortages, such as have been more or less prevalent for the past 20 years, some work must be deferred until a more opportune time, and the supervisor, having a more accurate knowledge of riding conditions in general, is in a better position to say which jobs shall be done first.

Another factor that affects supervision methods concerns the growing use of power-operated track machines in specialized gangs used on a district, and in some cases on a division or system basis. The supervisor must indicate where such gangs will work each day and must plan, in considerable detail, the job as a whole.

A foreman of such a specialized gang will not have time to look for places where work is required nor, owing to his working over a large territory, will he have any knowledge of special conditions he may encounter. Consequently, he must be lined up in detail by the supervisor.

Because of these factors, the tendency of late years has been for the supervisor to outline in considerable detail each day's work and I believe this practice is becoming more prevalent. This, no doubt, is having an adverse effect on the initiative and resourcefulness of track foremen, but where sufficient supervision is provided to keep all gangs lined

---

Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the March Issue

1. To what extent are luminescent or reflective materials adaptable for use on crossing signs, crossing gates, and other roadway structures where a high warning value is desirable? Explain.
2. Should special buildings be provided for housing the highway trucks used by the maintenance-of-way forces? What are the desirable features of location and design? Can existing buildings be adapted for this purpose? Explain.
3. What color should work equipment and roadway machines be painted? Why? Should colors be standardized throughout the industry? Explain.
4. To what extent is the practice of maintaining water barrels on bridges and trestles justified by the degree of fire protection afforded? Would sand be as effective as water for controlling incipient fires in these structures? Is it practicable to keep buckets available at such water barrels? If so, how can it be done?
5. At what intervals should track bolts be tightened after rail is laid? Why? What factors are involved?
6. Under what conditions is the "internal" method of water treatment satisfactory for Diesel locomotives? Explain.
7. How serious is the problem of corrosion of the steelwork in steel-frame buildings, resulting from the walls not being watertight? What precautions can be observed in the design and construction of walls to assure their watertightness? Explain.

up, more production is usually secured from each gang. The track organization on each roadmaster's district now resembles a single unit, in which each section and extra gang must function as an integral part, and if any one part is out of step with the balance of the organization the entire unit will suffer.

Foremen should be encouraged as much as possible to think for themselves, and should be kept advised of the reason for the work as outlined by the supervisor so they can give their advice on the work being done, as well as feel that they have a part in the organization. Foremen should be encouraged as much as practicable to use their own methods in doing the work outlined by the supervisor, and should be held responsible for the quality of the work done, as well as the amount of work performed by the gang. Also, foremen should be encouraged to plan their work in advance, with the understanding they will work on their own plan unless sent elsewhere by the supervisor. Under this scheme, when the work assigned by the supervisor has been finished, the foremen will return to their own plans. This should be discussed by the foreman and supervisor so they will both know what is to be done.

Although present conditions have made it more and more necessary for supervisors to outline work in greater detail, everything possible should be done to retain as much as possible of the initiative of the individual foremen.

Foremen Proud to Plan Work

By F. L. Wilson
Roadmaster, Missouri-Kansas-Texas, DeLeon, Tex.

Most of our section foremen are experienced men and have their work planned for days ahead. Most of them will carry out a self-planned program to good advantage if encouraged and cooperated with.

The average section foreman feels his responsibility. He gives the planning of his work a lot of his time and takes a lot of pride in a well-done job that he has planned. When you lay out his work for him daily, you take something away from him and make a tool out of him.

Before I change a section foreman's plans, except in cases of emergencies, I always contact him personally and find out what his plans for the next few days are. If I have something that I think should be done instead, I explain why I want to change his plans. I can always get him to do the work I think preferable without making him feel that he has been all wrong in his planning. I think it is a good idea to let foremen always feel they have a part in the planning. Most men do a better job when they feel they are doing their own job than when they will feel they are doing some one else's bidding.

Foremen must be governed by conditions, and the daily planning by roadmasters sometimes cannot be done because of emergencies that arise. This always calls for explanations which lead to discord. Too much detailed planning always tends to make foremen depend upon their roadmasters or supervisors to lay out their work for them. When an emergency arises, such foremen are lost, and in most cases practically helpless.

Extra gangs can be handled differently. In most cases this work has been planned, and I favor getting with the foreman and going over the situation with him as to how much is to be spent, how soon the work should be done, and what machinery and labor he is to have. Give him a general line-up and let him know he is to receive credit for a good job or discredit for bad results, as the case may be, and there will be very few of the latter.

Permit Foremen to Plan

By Maurice N. Heath
Section Foreman, Boston & Maine, Lisbon, N. H.

The duty of a roadmaster or track supervisor is essentially the overall inspection and superintendence of the work performed on his territory. For him to endeavor to plan in detail the daily operations of his section foremen would be placing a burden upon himself which would seriously impair the entire purpose of his position. It is right and proper for a supervisor to have a series of conferences with his foremen in the spring and prepare a program of work for the season. These should supplement regular early spring foremen's meetings.

The track foreman has a much smaller portion of trackage for which he is responsible than has the roadmaster. He can, therefore, note conditions each day and plan his work for the following day to better advantage than if he depends upon the supervisor to plan it for him. It is, however, expedient for the track foreman to confer with his supervisor frequently and thus keep him informed as to the progress of the work as planned in the spring. There are numerous problems which are certain to arise from time to time, making it necessary to interrupt the general work program. Many of these will come first to the attention of the track foreman, some of which will have to be referred to the roadmaster before being acted upon. By the same reasoning, many extra jobs will first come to the supervisor's attention and he, in turn, will have to confer with the track foreman and arrange for their completion, after which the foreman can return to his regular program work.

Extra-gang foremen are, as a rule, moved from one location to another. Their work can, to a certain degree, be programmed much the same as that of a section foreman. Here again, certain emergencies will arise during the course of a season which will necessitate a deviation from the program work. However, the supervisor can follow the progress of the extra-gang's work by conferring with the foreman at regular intervals, the same as with his section foremen.

The work of the patrol foreman is more or less routine and once a program is established he can usually follow it. He should, and does, have certain seasonal duties which can easily be tied into his program without interferring with his periodic inspections of track facilities. Thus, his work should require a minimum of daily planning.

It can readily be seen that if a supervisor should attempt to plan the daily operations of his foremen, much valuable time would be lost contacting them and the whole purpose of his position would be defeated by the confusion of varying conditions from one section to another.

showing where he is to work smoothing up his track, he will not jump around, but will consistantly work practically out-of-face getting the oldest track first. It is true that a roadmaster or track supervisor will occasionally take him off his regular work to get a rough spot, but afterwards he can get right back to where he left off.

The grouting of soft spots, weed control, and the use of off-track ditchers have done much to minimize the detail of the section gang, but what detail is left can be done best if directed by the track supervisor or roadmaster.

Supervisor Should Plan Work

By Track Supervisor

I believe roadmasters and supervisors should plan in detail the daily operations of their section and extra-gang foremen. Extra-gang foremen, engaged in reballasting, tieing and other out-of-face track raising work should be given a schedule for their entire season, showing the track to be raised, the points between which work is to be done, and the dates when each stretch is to be started and completed.

A schedule such as this, besides giving the foreman definite information, will time the arrival of ties, ballast and other materials. If the schedule cannot be maintained for one reason or another, the delivery of materials can be adjusted accordingly. When these details are handled by the roadmaster or supervisor, the number of expensive work train interruptions can be minimized. Schedules for extra gangs engaged in terminal work are subject to the permission of a general yard master and must be planned weeks in advance. Such schedules are hard to plan too far in advance but, here too, the detail planning should be done by the roadmaster or track supervisor since adequate arrangements for handling materials are essential to the operation and production of the gang.

Many section foreman, if left alone, will too often wander into a non-constructive manner of doing work, performing small one and two-man jobs with four, five or more men, and too often will do work assigned to them by other departments. To gain maximum results, the section foreman's work must be detailed by the roadmaster or track supervisor. The foreman must be kept informed where extra gangs will work on his section, what track will be raised, and what switches will be repaired. If a schedule is made up

Establishing Sign Painting Shops

To what extent is it feasible to establish well-equipped, dision or system sign painting shops, such as are maintained by many state highway departments—bringing signs, or parts of signs, to the shop, rather than paint them in the field? What are the advantages and disadvantages of the shop and field methods?

Shop Painting Too Expensive

By F. M. Misch

General Bridge and Building Supervisor, Southern Pacific, San Francisco, Cal.

Painting roadway signs is an expensive and continually recurring maintenance problem. Reducing this expense to the minimum and still keeping signs legible for safe operations requires more consideration than is given at present by most maintenance men.

The method proposed of establishing well-equipped sign painting shops appears on the surface to be a logical approach, and a means of reducing costs by mass production. Roadway signs can be painted in a well-equipped shop under the most advantageous conditions during all seasons of weather. Proper drying between successive coats can be assured and stencils made available for all types of lettering. Spray painting could be used on most of the work and silk screens are available to simulate hand lettering. There can be no question that the shop painting of roadway signs can be accomplished at minimum of cost, and a crew could work the year around on sign production.

However, after these signs are painted in the shop at minimum cost there are still the problems of shipping and placing these signs at proper locations. Every railroad has its common standards for roadway signs. In general, many of these signs are set in the ground or nailed to structures. Placement will require the time of either a section gang or a B.&B. gang. Excavating for the signs cost money, and placement, if not carefully done, could result in unsightly signs, out of plumb, and possibly at improper locations. Some thought could be given to the use of galvanized lag screws or bolts or other means of attachment to reduce the cost of sign removal.

After removal the old sign must be shipped back to the central paint shop. It may have been damaged in removal and require repair. If the lettering is changed, additional cover coats will be required. These items result in additional costs. The net results increase the overall costs, with the possibility that a considerable amount of sign material for replacements would have to be purchased and signs would meet themselves coming and going.

Shop painting and field painting of roadway signs have been tried at many locations. From these experiences it has been found that the most economical program results from a combination of the two methods. Well-equipped roadway sign-painting gang is essential. Such a gang should be equipped with modern tools, including a small portable paint sprayer, suitable ladders and staging a light truck and a motor car for transportation, and an outfit car fitted up as a paint shop. The gang can be furnished with a minimum number of painted standard signs for replacements where needed, and could paint in place the remaining signs when covering the line. During the winter, when weather makes painting impracticable, this gang can shop paint standard signs.

Even if the most economical method of painting roadway signs has been found, the reason for the high cost of maintenance may not have been considered. I definitely feel that this high cost is due to the use of poor quality paints. The all-important item in painting is the labor cost, which can be reduced by using the best quality paints so that the service life of each sign can be increased to the greatest possible extent. Experiments have shown that the use of best quality paints covered by a coat of clear weather-proof varnish has greatly increased the service life of signs. Better grades of paints are still needed, and it is possible that the new plastic paints may provide the answer. Roadway sign maintenance will be at the minimum when it will only be necessary to paint signs once in ten years—washing them off in the meantime, when necessary.

Shops Are Not Feasible

By M. J. HUBBARD
General Supervisor Bridges and Buildings, Chesapeake & Ohio, Richmond, Va.

I do not think a well-equipped division paint shop such as maintained by highway departments is feasible on a railroad because of the large number of types, sizes, and locations of signs. One of the larger signs that all railroads have in great numbers is the highway crossing sign that has different wording on its blades for various states. It would not be economical to remove such signs when they need painting and ship them to a division or system paint shops. Metal crossing signs with flasher lights could not be removed very easily or economically for painting. Furthermore, there are a lot of other signs of various types along the right-of-way that have to be set with a rather heavy base, to keep them erect, that would not be economical to remove.

The system paint shop, or the small division paint shop, for making and printing new signs for installation at various points on divisions, is a very good, economical arrangement of new signs, but for painting various stationary signs on divisions the most economical arrangement is to assign a sign painter and painter-helper to do this work during the summer and fall months, with headquarters in a camp car to permit their movement from point to point along the division, with a motor car or small highway truck being used to reach signs along the right-of-way.

The chief advantage of shop painting is that a better, cleaner paint job will result than when signs are painted in the field. But there are some good quick-drying outside white paints on the market today that allow signs to be stenciled right after painting, without the lapse of time required when a white lead and oil paint is used, thereby eliminating the collection of dirt on the slow-drying paint.

Safe Ways of Unloading Long Piles

When it is necessary to unload long piles from flat cars, how can this best be done to avoid possible injury to workmen? Explain.*

Use Crane and Bridle Sling

By J. A. LOCKWOOD
Supervisor Bridge Erection, Chesapeake & Ohio, Richmond, Va.

The safest way that I have used to unload long piles from flat cars is to use a crane, handling the piles with a bridle sling. The bridle sling is made up of two chains or cables attached to a single ring, with the ring attached to the crane line. On the end of each chain or cable is a set of timber hooks. In attaching the two sets of hooks to the pile, care is taken to keep the center of gravity of the pile as nearly as possible half way between them.

When the pile is lifted, it is comparatively free of the tendency to swing and neither end is overbalanced. The ends of the pile can be safely handled for placing on the ground or wherever they are to be landed. With this method, the pile can be worked out more safely from beneath any guys or tie wires holding the standards together.

The chance of damage to the pile by breaking or splintering is greatly reduced by handling in this manner. If other than a crane is used, removal of the standards, or stakes, on the sides of the flat car is necessary and there is a greater chance of injuring a workman assigned to the job. If piles are rolled off cars, or slacked off with ropes, they are easily damaged.

*Additional material has been received on this question, but, because of its scope, it is being withheld for publication in a subsequent issue.

Slotting Rail Ends Periodically

Should rail ends be slotted periodically? Why? What factors determine when re-slotting should be done?

Slot Before Chipping Occurs

By E. H. BARNHART
Division Engineer, Baltimore & Ohio, Garrett, Ind.

There should not be much question among railroad men of the necessity or advisability of slotting rail. However, there has been some difference of opinion from time to time as to just when this slotting should take place. One line of thought is that the new rail should be laid in track and allowed to cold roll by traffic before the rail ends are slotted, the period of cold rolling varying, of course, with the amount of traffic, from three months to six months.

A second line of thought calls for the slotting of the rail at the mill. I think that this latter practice has had more advocates in the past year or two than the former, and many railroads are now having their new rail slotted at the mill. I believe this is the better policy.

The question of re-slotting rail after it has been in service in track is one which requires considerable study and investigation. Of course, the re-slotting is dependent upon traffic conditions, local roadbed conditions and standards of maintenance. I do not believe any hard

and fast rule can be laid down covering such re-slotting. There is only one condition which will govern—when the rail ends show signs of chipping it is time to start the re-slotting, and possibly even rail-end welding in conjunction with the slotting. Of course, there are conditions where the cold rolling by the wheels may cause the ends to come together and this should be taken care of by re-slotting, if possible, before the expansion gap at the top of the head of the rail is entirely closed.

Don't Slot Periodically

By Engineer Maintenance of Way

I do not believe that rail should be slotted at any stated periods, but rather that any slotting which is necessary should be taken care of immediately upon the detection of a condition making it desirable. This will eliminate any possibility of the rail ends chipping and subsequent damage to the rails.

Reslotting should be done as soon as the rail ends give any indication of metal flow or when rail ends are in contact one with another due to improper or insufficient anchorage.

It is believed that the most satisfactory results can be obtained if slotting is done during the summer months when the rails are expanded due to heat. In any event the first indication of flowing metal at the rail ends or of tight rail should call for immediate action, regardless of the number of joints involved or the time of the year.

Base Program on Conditions

By A. H. Whisler

Assistant Engineer, Pennsylvania, Philadelphia, Pa.

Expressing my personal opinions, which are not necessarily representative of standard practices on the Pennsylvania Railroad, I would say that no basis can be established for periodically slotting or cross-grinding of rail ends in track until many variables now existing are made constant. The top edges at the ends of all new or cropped rail should be chamfered or beveled at the mills for a distance of approximately 1/16 in. from the face of the end of the rail. Hence, the rail ends need not be slotted or cross-ground in track until the flowed or rolled metal at the ends has reached the vertical plane of the rail end. The flowed or rolled metal at the surfaces of adjoining rail ends must be prevented from touching before the vertical ends of the rails contact each other.

The speed of trains, wheel loads, the opening between rail ends, the hardness of rail surface, temperatures, etc., all have a definite bearing on the amount of rail head surface metal that will roll or flow over, or that will be pushed beyond the line of the rail end.

New rail, with surface metal at its lowest degree of hardness, will be laid in track with a greater opening between rail ends during the cold winter weather than when it is laid during the hot summer months. If the speed of wheels passing over the joints, the weights on those wheels, and rail temperatures all remain constant, damage to the receiving rail ends due to the hammer blow of wheels will be proportionate to the distance between the rail ends.

The surface metal of "hot" rails during summer months will roll or flow faster than that of "cold" rails during winter months. Therefore, the "leaving" ends of rails will be subject to a greater flow of metal during the summer months than during the winter months.

As long as the safe passage of trains is not affected, and often due to circumstances beyond our control, many of us have become accustomed to deferring until tomorrow things that can, in all probability, be done more economically today. We will argue that because we can pass a cigarette paper between the rail ends, the flowed or rolled metal at the rail surfaces is not in contact, and we will gamble for cooler weather "tomorrow" and defer the slotting or cross-grinding. Sometimes we win and sometimes we lose. If overnight, or before that "tomorrow" comes, the surface metal at the rail ends chips or spalls, we then have a welding job to do which will cost 10 to 20 times what the grinding job would have cost "yesterday."

With these factors in mind, I would say that rail slotting or cross-grinding should definitely be programmed after a genuine study has been made of the rail conditions and the traffic that has or will pass over the rail.

Welding in Water Service Work

To what classes of water service work is welding adapted? What types of equipment are most suitable? Explain.

Welding Getting Popular

By G. E. Martin

Superintendent Water Service, Illinois Central, Chicago

Welding in water service work has become very popular in the last several years. It is widely used for installing wrought iron and steel pipe lines, and is particularly suited for the installation of this type of pipe more than 2 in. in diameter. The cost of cutting and fitting the larger sizes of pipe is quite high as compared with welding. Welding is now commonly used for installing air, water and steam lines in enginehouses and shop buildings. Repairs to these lines can be made readily by welding defective pieces of pipe, and replacements can be made at much less cost than by cutting and threading as has been the practice in the past. Many repairs to water and fuel stations, the latter frequently handled by water service men, can be made by welding with considerable saving in the cost of the work and the time the station is out of service. Welding and cutting torches have many times been very beneficial in making repairs to machinery. The removal of sprockets and gears from shafts, when they are tight and troublesome to move, can be made easier by heating the hubs as rapidly as possible, causing them to expand on the shaft. The cutting and fitting of patches on sheet steel is greatly facilitated with a torch.

Oxyacetylene welding is most widely used in this type of work, largely because the equipment is

less expensive and can be moved readily from one point to another. This type of welding is well suited for installation and repair work. The equipment required consists of oxygen and acetylene gages, hose from tanks to torches, and welding and cutting torches. It is also quite convenient to have two-wheel carts for moving tanks short distances.

Some railroads have provided water service gangs with arc welding outfits. While these outfits may be used satisfactorily for the welding of pipe, the justification for the expenditure for this type of welding equipment is usually on the basis of its need for making repairs to sheet steel structures, such as steel coal chutes and water tanks. In this type of welding it is desirable to limit the heat to the point where a weld is made to prevent warping of the sheets. The equipment generally consists of a gasoline-engine-driven generator with welding tools and electrodes.

Valuable in Emergencies

By C. L. Waterbury
Engineer and Superintendent Fuel and Water Service, Chicago, Milwaukee, St. Paul & Pacific, Chicago

Welding is very valuable for making emergency repairs to pipe lines, mechanical equipment, tanks, etc., when replacement parts are not available and the water facilities must be kept in operation without delay. It is often possible to prepare a pitted or worn out pipe, pump, machine gear or similar part for continued use, or for temporary use pending the arrival of replacements parts.

When new construction or remodeling work is under way, it is often convenient to fabricate a pipe bend or elbow, or some other fitting, by means of welding short sections of steel pipe together. It is also convenient to weld steel flanges on fittings where required. Frequently it is necessary to cut holes in chemical vats, weld pipe couplings through the sides of tanks or vats, or cut metal shims for the proper leveling of tanks or machinery. In many railroad organizations the water service men are responsible for the installation of Diesel fuel oil pipe lines and the pumping facilities. To eliminate leakage, the best possible construction consists of welded steel pipe with an adequate coating for protection against corrosion or electrolysis.

Where water service employees are not required to qualify on the application of welding equipment and are not regularly assigned such equipment, supervisors should take the necessary precautions to know that these employees do not borrow from some other departments, or from an outside source, equipment which is not in safe operating condition. They should also assure themselves that the employees have had sufficient training to avoid unnecessary injuries or hazard of setting fires to buildings or other structures on which they may be working.

It sometimes happens that a careless workman will unnecessarily damage useable material or equipment when cutting it up for dismantling or for removal from its original installation. Water service employees have been known to waste time and material moving welding equipment to a small job that could be done more easily by other methods. This also has been true in the case of small cutting jobs which could be done better by a hack saw or similar means.

The type of equipment best suited to water service work depends to some extent upon the type of territory and the type of facilities to be maintained in that territory. Each employee has some preference with regard to equipment and no standardization has been attempted to date on the Milwaukee.

Classifying Fire-Retardance

How are building materials classified as to their relative fire-retardance? To what extent can these classifications be bettered by the application of fire-retardant coatings? What type coatings are particularly effective? Explain.

Must Define Terms Used

By
Assistant Engineer of Buildings

I have long been interested in fire-proofing lumber either by the impregnation of chemicals under pressure or by surface treatment. Throughout that time I have been confused in reading articles in the public press and in trade journals by a seeming lack of uniformity in rating the burning characteristics or degree of fire-proofing given to different treatments. Some authors write of the fire-resistance of various materials in terms of minutes, while others express fire hazards in terms of a code number or a relative rating based on an arbitrary 100 value being given to the resistance of untreated oak. I did not attempt to resolve, in my own mind this lack of uniformity in technical terminology, in spite of its consequent confusion, until I tried to answer to my own satisfaction this question in your magazine. Finding that I was unable to do so with the information in hand, I wrote the Underwriters' Laboratories, Inc., asking that they clarify my misunderstanding. J. A. Neale, vice president and chief engineer, replied that my confusion seemed to exist because of a lack of understanding of the terms "fire-resistance rating" and "fire-hazard classification."

In his words, "**fire-resistance rating** is a term applied to structural assemblies which indicates the length of time that a structural member will resist the standard fire test without failure. Failure consists of collapse of a column or girder, and either collapse of or transmission of fire through, a wall, floor, partition, fire door, fire window, etc." Hence, it is expressed in minutes.

Fire-resistance ratings of various materials and the methods by which they are determined are covered in considerable detail by Chapter 24 of the current (tenth edition) of the "NFPA Handbook for Fire Protection."

The other term frequently used, "**fire hazard classification,** is a measure of the rate in which fire spreads over the surface of building material and has no connection whatever with the term, **fire resistance rating.**" For many years the fire resistance and fire retardant ratings of structural parts of buildings, such as walls, columns,

floors, partitions, and ceilings have been expressed on the basis of results obtained in accordance with what is known as the Standard Fire Test Specifications. The ratings indicated how these components resist the penetration of flame, structural failure, and excessive deterioration from fire temperatures. According to A. J. Steiner, Engineer, Protection department, Underwriters' Laboratories, Inc., these classifications or ratings gave little consideration to the burning characteristics (fire-hazards) of materials forming the exposed surfaces of buildings. He also says, "Such materials may or may not contribute to the fire hazard at the place of their use, according to the extent to which they permit the spread of flame, provide fuel for fire and produce objectionable smoke while burning."

Accordingly, research was undertaken "to develop test equipment and methods whereby building materials may be classified as to their fire hazard in comparison with the hazard of commonly available materials that have established field records." That research resulted in the term **fire-hazard classification**, as described above, and has been published in detail in their Bulletin of Research No. 32 dated September, 1944.

According to this bulletin, the spread of flame was determined by observing the time and extent of flame development along the surface of a sample as a result of exposing it to fire. For example, when the igniting fire was applied against the surface of red oak, the control material, the flame spread 18½ ft. in approximately six min. By then evaluating the distance and time of spread of fire for each material in comparison with that developed for red oak as 100, and asbestos-cement board as zero, a numerical classification was established. It is this "flame spread classification" portion of Bulletin 32 that is outlined in a sub-committee report of the A.R.E.A. committee on buildings, pages 284 to 288, Vol. 50, 1949.

According to Mr. Neale, the research referred to above developd that the "fire-hazard classification" of some combustible materials can be reduced in varying amounts by treating the material by either impregnation or by surface treatments. Some of these treatments have been evaluated by Underwriters' Laboratories, Inc., and appear in their List of Inspected Fire Protection Equipment and Materials, January, 1949, on pages 19 and 20. New materials have been investigated and their evaluations will appear in a new list to be published this month.

In general, such evaluations have indicated that the application of fire retardant coatings reduces the flame spread classification number of the untreated material to a figure varying between 30 and 60, depending on the type of treatment, its penetration or the coverage per gallon of the coating material. This means that such coatings are somewhat less than half as hazardous as untreated oak.

What Length Legs on Spring Frogs?

What are the relative merits of spring frogs having short spring rails and those with equal-length legs? Under what circumstances is the use of each indicated? Explain.

Both Designs Have Merit

By A. F. HUBER
Chief Engineer, American Brake Shoe Company, Ramapo Ajax Division, Chicago

Each of the two designs has certain advantages as indicated by their fairly evenly divided use in this country. Many designers favor the short spring rail construction because of its compactness and improved alinement, and the stability provided by the support of the unbroken rigid wing rail to the toe joint of the spring rail. Shorter guard rails on the main-line run are more effective and are generally used with this design of frog. On the other hand, equal toe length frogs are preferred by some because of their interchangeability with rigid frogs, and because their toe joints require less looseness to permit the spring rail to open for turnout traffic. Modern design of both types, as recommended by A.R.E.A. plans, include a heavy multiple tie base plate for the body of the frog, the use of bolts instead of rivets for all fastenings, and extra strong spring assemblies. Recent improvements now under consideration include a more secure attachment of the hold-down devices and a two-tie plate at the toe joint to provide better support for the spring rail and to limit its vertical movement under traffic. These features all insure a structure that can be economically maintained to insure smooth and safe traffic movements.

Although the use of the two designs is divided, fairly evenly, as stated above, the short-toe design appears to be the more popular to the writer since some users of the equal toe length frogs are changing to the short toe design, while the reverse is not true.

Short Wings Are Better

By T. H. BEEBE
Chief Draftsman, Chicago & North Western, Chicago

The short spring rail design is superior for the following reasons:

(1) The absence of a joint in the rigid wing rail opposite the toe of the spring rail, together with a suitable toe block, provides a firmer support at the toe of the spring rail.

(2) In trailing movements a firmly supported spring rail toe is essential to be effective in reducing the tendency of the heel end of the spring rail to raise under traffic owing to the progressive wear of parts.

(3) Under similar conditions of speed and traffic, the short spring rail design is less expensive to maintain because the toe ties under the equal-arm design require tamping and renewal with greater frequency.

(4) There is less liability of breakage in the short spring rails.

PRODUCTS OF MANUFACTURERS

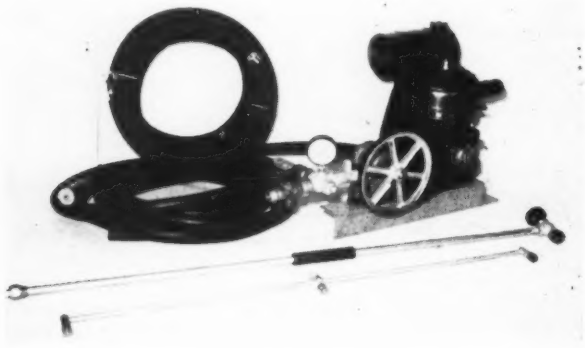
New, improved equipment, materials, devices

(For additional information on any of the products described in these columns, use postcards, page 19)

WEED SPRAY UNIT

IN carrying out a recent weed-control program involving the use of 2,4-D, the Chicago Great Western operated a portable spraying unit specially built and assembled by the O. W. Kromer Company, Minneapolis, Minn., to meet the specific requirements of the road.

The equipment consists of a skid-mounted pumping unit direct-driven by a 2½-hp. gasoline-engine, and two 50-ft. lengths of chemical - resistant hose, each equipped with a lightweight, T-shaped spraying wand. The pump, self-lubricating and simple in design, develops pressures up to 300 lb. The cross bar of each wand has three fan-type nozzles spaced 20 in. apart, making it possible to spray a 5-ft. swath with each pass. The equipment, along with a 60-gal. steel barrel containing the spray solution, is carried on a push car.



Showing the various components of the weed-spraying equipment developed by the O. W. Kromer Company and used on the Chicago Great Western

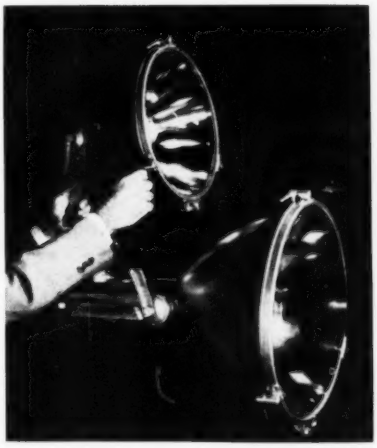
With one man handling each wand, the right-of-way on both sides of the track can be sprayed simultaneously. When it is desired to reach weeds a greater distance than 50 ft. from the track, the two hoses are joined together.

The road reports that the equipment is proving to be satisfactory, particularly in spraying weed growths along fences, in swampy areas, on steep banks and at other locations inaccessible to mowers. The spray solution being used is Weedone Concentrate 48 mixed with water in the ratio of about 1 to 100. About five pints of the solution are required to spray an area of one acre.

HEAVY-DUTY FLOODLIGHTS

THE Lighting and Rectifier Divisions of the General Electric Company, Schnectady, N. Y., have announced two new heavy-duty general-purpose floodlights — the Type L-84, rated at 500 watts, and the Type L-85, rated at 1000 watts. The lights are constructed of non-corrosive materials—aluminum and stainless steel—and each weighs less than 17 lb.

The door of each lamp is hinged for easy relamping and is equipped with swing-type latches. The door glass is heat resistant and is cushioned in a silicone rubber gasket which wraps around the edge of the glass and also seals the joint between the door and the casing. Each light is equipped with a clamping handle for vertical adjustments. The floodlights can be furnished with either narrow-beam polished or wide-beam etched reflectors. Both models are available in three standard types of mountings, including a portable base.



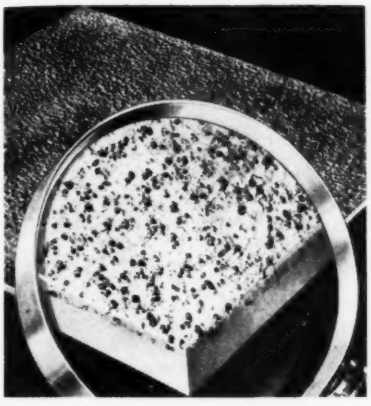
The new G-E heavy-duty general-purpose floodlights. The Type L-84 (top) is rated at 500 watts; the Type L-85 (bottom) is rated at 1000 watts

NON-SKID FLOOR PLATE

THE Alan Wood Steel Company, Conshohocken, Pa., is now offering a non-skid steel floor plate in which an abrasive grain, similar to that used in grinding wheels, is rolled as an integral part of the upper portion of the plate. The new floor plate is being marketed under the trade name A. W. Algrip and is being rolled in quantities that enable the manufacturer to offer prompt delivery.

The new material is reported as being especially effective when

used for industrial floors, loading platforms and ramps, walkways, building entrances, hatch covers, elevator floors and sills, elevated passenger platform edges, and in many other applications where there is danger of accident due to slipping.



The abrasive material in the Algrip floor plate is rolled as an integral part of the upper surface of the plate

According to the manufacturer, A. W. Algrip may be sheared, blanked, notched, or circle-sheared on standard shop equipment. It can be gas or arc-welded, drilled, punched or beveled. Flanging is not recommended, except when the abrasive side is under compression, as when the flange is bent up, in which case the work may be done on conventional bending equipment. If forming is desired, the manufacturer should be consulted.

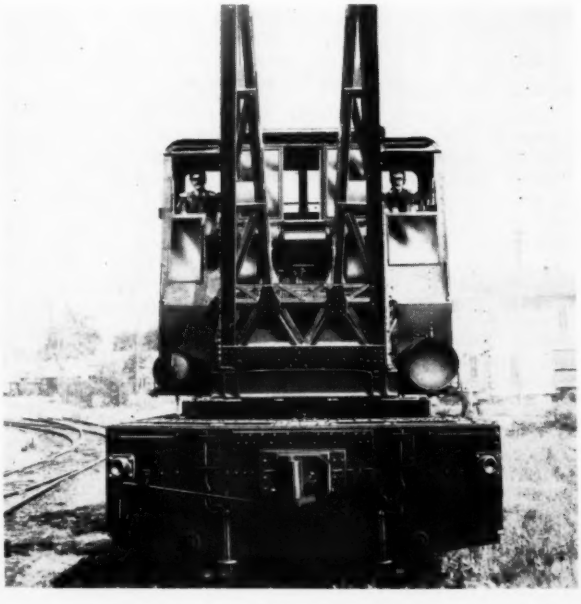
A. W. Algrip floor plates are available in thicknesses from ⅛ in. to ⅜ in. and widths up to 60 in. Maximum plate length is 144 in. If longer lengths are desired, the manufacturer should be consulted.

LOCOMOTIVE CRANE WITH DUAL CONTROLS

THE Industrial Brownhoist Corporation, Bay City, Mich., has developed a Diesel-operated locomotive crane for railroad maintenance-of-way work which is reported to provide a range of operator vision so extensive that the need for ground men to give directions is eliminated. This has been made possible by setting the cab high on the crane, extending it entirely across the width of the crane, and providing two sets of interlocking controls in the cab, one set at each side.

This arrangement gives the operator full rear vision and permits him to look down into a car while loading or unloading it. The dual controls permit him to operate the crane from the side that gives him the best view of the work. For work on the right side of the track, for example, he can use the controls on the right side of the cab. If the work shifts to the left side of the track, the operator locks the right-side controls and moves over to the controls on the left side, never leaving the cab. For work requiring special safety precautions, both sets of controls can be left open to permit the crane to be operated by two men, one at each side.

The new machine is known as the maintenance-of-way crane. Three of these dual-control cranes, each with a 30-ton capacity, were recently delivered to a large eastern railroad. Each of these models is equipped with a 50-ft. open-type boom that gives the operator maximum vision when the boom is directly in line with the work. Each has three travel speeds, with a maximum of 13 m.p.h. The trucks are equipped with a simple travel-gear disengaging mechanism that makes it possible to prepare the crane in a matter of minutes for hauling in a train. All the cranes are equipped for hook, clamshell or magnet work.



The Industrial Brownhoist Diesel-operated maintenance-of-way crane with dual controls

New Book

CHOOSING SIZES OF EXCAVATORS AND TRUCKS

PROPER Sizing of Excavators and Hauling Equipment. Technical Bulletin No. 3, 24 pages. Published by the Power Crane & Shovel Association, New York. Price 50 cents.

THIS bulletin, the third of a series being produced by the Power Crane & Shovel Assoociation, dealing with power cranes and shovels, is intended to round out the information covered in the previous bulletins. It deals with the problems of choosing the proper excavating equipment for a particular job, and the proper synchronization of the hauling fleet with the excavator to obtain maximum output and minimum delay in job operations.

The study analyzes the various factors affecting efficient operation on a job, such as type of material excavated, volume of work, spotting units at the shovel, distance of haul, and hauling cycles. Practical suggestions are offered for improving production. Of considerable value as a guide are the performance tables, based on the various factors involved, which are included in the text. The formulae on which the tables are based are given in an appendix.

THE MONTH'S NEWS

Happenings among the railways — the associations — the suppliers

Changes in Railway Personnel

General

R. F. P. Bowman, division engineer of the Brandon division of the Canadian Pacific, at Brandon, Man., has been promoted to assistant superintendent of the Medicine Hat division, with headquarters at Bassano, Alta.

H. H. Clark, assistant to the vice-president of the Erie, has been promoted to superintendent of transportation, with headquarters as before at Cleveland, Ohio. **J. P. Allison,** division superintendent at Salamanca, N. Y., has been advanced to assistant general manager of the Western district, with headquarters at Youngstown, Ohio. Both of these men are engineers by training and experience.

Engineering

L. H. Powell, whose promotion to chief engineer, Coast Lines, of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, Cal., was reported in the December issue, was born in Baird, Tex., on July 16, 1891, and started his railroad career on September 1, 1909, with the Gulf, Colorado & Santa Fe. On June 18, 1919, he entered the service of the Santa Fe as accountant in the chief engineer's office, and on May 1, 1920, he was advanced to assistant engineer in the same office. Mr. Powell was appointed assistant to chief engineer, system, on February 1, 1943, and served in that capacity until his recent promotion.

L. H. Powell

William Landess, mechanical superintendent of the Chicago Union Station Company, has been appointed chief engineer.

A. V. Johnston, office engineer in the office of the chief engineer, Central region, of the Canadian National, has been promoted to assistant chief engineer of that region, with headquarters remaining at Toronto, Ont.

M. Hirschthal, concrete engineer on the Delaware, Lackawanna & Western, with headquarters at Hoboken, N. J. has retired after more than 42 years of service with this road. Mr. Hirschthal has established an office as a consulting engineer at 420 Madison Avenue, New York.

H. P. Gillespie, instrumentman on the Chicago, Burlington & Quincy, with headquarters at Reliance, Neb., has been promoted to division engineer, with the same headquarters, succeeding **E. A. Graham,** who has been transferred to Lincoln, Neb. Mr. Graham replaces **I. W. Scott,** who has been appointed office engineer and chief clerk, succeeding **A. W. Andrews,** who has retired after 44 years service. These changes were effective January 1.

R. D. Ransome, supervisor of bridges and buildings on the Chicago & North Western, with headquarters at Madison, Wis., has been promoted to division engineer at Escanaba, Mich., succeeding **B. G. Packard,** who has been transferred to the Dakota division, with headquarters at Huron, S. D. Mr. Packard succeeds **J. W. Johnson,** who has been assigned to other duties.

Albert A. Miller, whose retirement as chief engineer maintenance of way and structures, of the Missouri Pacific, with headquarters at St. Louis, Mo., was announced in the December issue, was born at Zanesville, Ohio, on September 28, 1879, and began his railroad engineering career in 1900, while still attending engineering school at Ohio State University, from which he received his B.S. degree in civil engineering in 1902. After serving successively as rodman, transitman, assistant division engineer and division engineer on the Baltimore & Ohio, he became chief engineer of a mining operation in Mexico in 1907. Two years later he joined the Missouri Pacific as assistant engineer in the maintenance of way department. Later he held the positions of division engineer at Kansas City, Mo.; general roadmaster at Poplar Bluffs, Mo.; engineer maintenance of way, at Little Rock, Ark.; district engineer at Kansas City; division superintendent at Poplar Bluffs and Wynne, Ark.; and engineer maintenance of way, at St. Louis. In 1938 Mr. Miller was advanced to chief engineer maintenance of way and structures, at St. Louis, holding this post until his retirement.

Albert A. Miller

Loren Shedd, designing engineer for the Grand Trunk Western, with headquarters at Detroit, Mich., has been appointed bridge engineer at that point, succeeding **T. H. Jenkins,** who has been appointed bridge engineer of the Central region of the Canadian National, with headquarters at Toronto, Ont. Mr. Jenkins succeeds **J. F. Salmon,** who has been assigned to special duties.

D. H. Dunphy, roadmaster on the Saskatoon division of the Canadian Pacific, at Wilkie, Sask., has been promoted to division engineer of the Edmonton division, with headquarters at Edmonton, Alta., where he succeeds **W. A. Smith,** who has been transferred to the Brandon division, at Brandon, Man., to replace **R. F. P. Bowman,** whose promotion to assistant superintendent is noted elsewhere in these columns.

(Please turn to page 68)

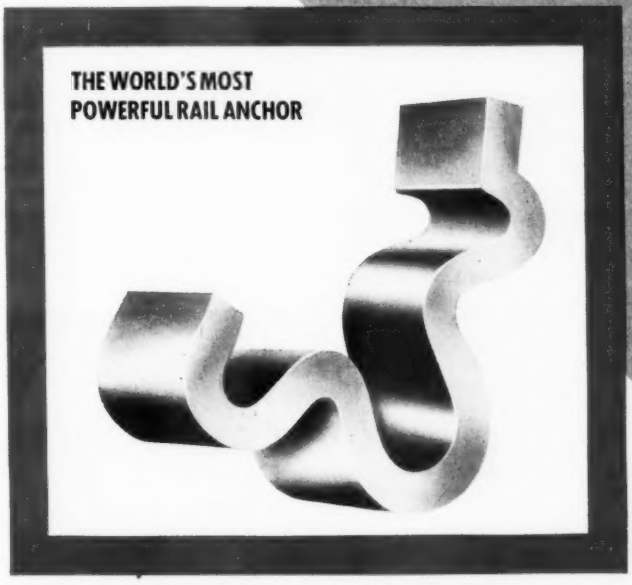
ou want a considered estimate of rail anchor value

...ask your branch line supervisors!

A Branch Line Supervisor seldom gets new material. A recent survey among Branch Line Supervisors indicated a *decided preference* for the Woodings *ADVANCED TYPE* Rail Anchor!

WHY? Because they receive *used* material . . . and of the used rail anchors they receive, the Woodings *ADVANCED TYPE anchor always shows the highest re-application value!*

If *you* want a *considered* estimate of rail anchor value — *ask your Branch Line Supervisors!*



Woodings *ADVANCED TYPE* Rail Anchor

WOODINGS FORGE & TOOL CO.

VERONA, PA. · CHICAGO, ILL.

Railway Personnel (Cont'd)

V. E. Glosup, division engineer on the Chicago, Milwaukee St. Paul & Pacific, with headquarters at Miles City, Mont., has been promoted to principal assistant engineer of the road's western lines, with headquarters at Seattle, Wash., effective January 1. **W. E. Fuhr,** division engineer, with headquarters at Ottumwa, Iowa, has been transferred to Miles City to replace Mr. Glosup, and **W. C. Whitham,** assistant division engineer with headquarters at Savanna, Ill., has been promoted to division engineer at Ottumwa to succeed Mr. Fuhr.

The Wheeling & Lake Erie was leased by and unified with the New York, Chicago & St. Louis, effective December 1, pursuant to authority of the Interstate Commerce Commission. The leased line is now known as the Wheeling & Lake Erie district of the Nickel Plate, and the engineering and maintenance officers of the W. & L. E. will, in general, continue to perform their regular duties but as officers of the Wheeling & Lake Erie district of the Nickel Plate. Thus, **W. L. Peoples,** engineer maintenance of way and structures, becomes district engineer, and **F. A. Poling,** assistant engineer maintenance of way and structures, becomes assistant district engineer, both with headquarters as before at Brewster, Ohio.

Charles T. Jackson, assistant chief engineer of the Chicago, Milwaukee, St. Paul & Pacific, has been promoted to chief engineer, with headquarters as before at Chicago, to succeed **Robert J. Middleton,** who, at his own request, has been relieved of the responsibilities of chief engineer and has been appointed consulting engineer, effective January 1. **W. G. Powrie,** engineer maintenance of way, has been promoted to assistant chief engineer to succeed Mr. Jackson.

Mr. Jackson was born on July 13, 1881, at Miami, Mo., and received his engineering education at the University of Missouri, from which he graduated in 1903. He entered the service of the Milwaukee upon graduation and his experience has covered location, construction and maintenance work. Previous to becoming assistant chief engineer, Mr. Jackson served successively as assistant engineer, resident engineer, locating engineer, district engineer, assistant engineer maintenance of way, and assistant to chief engineer.

Mr. Middleton was born near Greenwood, Ark., on September 29, 1881, and received a B.S. degree in civil engineering from the University of Arkansas in 1903. He entered railroad service in February 1906, as a draftsman in the bridge and building department of the Milwaukee. Subsequently, he served as assistant engineer on bridge and building work at Ottumwa, Iowa, assistant engineer on track elevation work at Evanston, Ill., and assistant engineer in charge of the construction of yards and engine-terminal facilities at Savanna and Bensenville, Ill. Mr. Middleton was advanced to engineer of track elevation in 1913, with headquarters at Chicago, and in 1916, he was promoted

Robert J. Middleton

to valuation engineer. On June, 1918, he was apponted assistant chief engineer, lines west of the Missouri River with headquarters at Seattle, Wash., serving in this position until March 1, 1933, when he was appointed assistant chief engineer at Chicago. He was promoted to chief engineer, system, on November 15, 1945, serving in that capacity until his recent appointment as consulting engineer.

Mr. Powrie was born at Milwaukee, Wis., on August 5, 1904, and entered railroad service in 1920 with the Milwaukee, serving for three months. In 1923, he returned to the Milwaukee as

W. G. Powrie

a chainman, serving subsequently as rodman, instrumentman, assistant engineer, assistant to general supervisor of bridges and buildings, and division engineer. In August, 1932, he was appointed asssistant engineer of water service, serving also as assistant superintendent of track maintenance from 1937 to 1941. Mr. Powrie was appointed engineer maintenance of way in May, 1941, the position he held at the time of his recent promotion to assistant chief engineer.

J. M. Fair, assistant chief engineer maintenance of way of the Central region of the Pennsylvania, with headquarters at Pittsburgh, Pa., retired on December 31 after 39 years of service.

W. H. Lord, assistant division engineer on the Nashville, Chattanooga & St. Louis, with headquarters at Chattanooga, Tenn., has retired after a railroad career of 43 years.

Track

C. Halverson, division roadmaster on the Great Northern, with headquarters at Willmar, Minn., has been promoted to general roadmsater of the Lines East of Williston, N. D., with the same headquarters. The position of general roadmaster had been vacant for some time. **Benjamin Treml,** district roadmaster at Minneapolis, Minn., has been promoted to division roadmaster at Willmar, succeeding Mr. Halverson.

William D. Kirby, foreman on the system rail gang of the Norfolk & Western, has been promoted to assistant roadmaster on the Radford divisien, succeeding **James M. Nimmo,** who has been transferred to Pulaski, Va., also on the Radford division, to replace **George W. Gearheart,** whose appointment as assistant supervisor of bridges and buildings is noted elsewhere in these columns.

C. S. Grimm, trainmaster on the Chicago, Rock Island & Pacific, with headquarters at Peoria, Ill., has been appointed roadmaster at Iowa City, Iowa, succeeding **J. W. Loftus,** who has been transferred to Des Moines, Iowa. Mr. Loftus succeeds **C. B. Murray,** who has been appointed trainmaster at Herington, Kan. **C. R. Slutts,** acting roadmaster at various points, has been appointed roadmaster at Fairbury, Neb., succeeding **A. N. Stamos,** who has been transferred to Atlantic, Iowa. Mr. Stamos succeeds **M. E. Lau,** who has been appointed trainmaster at Des Moines.

K. J. Lockhard, general track foreman on the Susquehanna division of the Pennsylvania, has been promoted to assistant supervisor of track on the Maryland division, with headquarters at York, Pa., succeeding **J. B. Hartranft,** who has been transferred to the Panhandle division, with headquarters at Steubenville, Ohio. Mr. Hartranft succeeds **J. M. Rankin,** who has been promoted to supervisor of track on the Chicago division at Logansport, Ind., succeeding **L. A. Pelton,** who has been transferred to the Philadelphia division, with headquarters at Earnest, Pa.

W. E. Smith, general foreman on the Erie at Port Jervis, N. Y., has been promoted to track supervisor on the New York division at Campbell Hall, N. Y., where he succeeds **J. K. Weikel,** who has been transferred to Forest City, Pa., a newly-created position. **A. B.**

(Continued on page 70)

Railway Personnel (Cont'd)

Packer, general foreman at Jersey City, N. J., has been promoted to track supervisor on the Kent division at Marion, Ohio, where he replaces **W. E. Pierson,** who has been transferred to Cuba, N. Y., on the Allegheny division. Mr. Pierson succeeds **J. F. McCarthy,** who has been transferred to Elmira, N. Y., on the Susquehanna division, to succeed **W. J. Moynihan,** who has retired.

Bridge and Building

M. E. Koenig, assistant supervisor of bridges and buildings on the Chicago & North Western, with headquarters at Boone, Ohio, has been promoted to supervisor of bridges and buildings, at Madison, Wis., succeeding **R. D. Ransome,** whose promotion to division engineer is noted elsewhere in these columns.

R. A. Westergren, master carpenter of the St. Louis division of the Pennsylvania, with headquarters at Terre-Haute, Ind, has been transferred to the Maryland division at Baltimore, Md., where he replaces **T. E. Angus,** who has been granted an indefinite leave of absence because of ill health.

George W. Gearhart, assistant roadmaster on the Radford division of the Norfolk & Western, at Pulaski, Va., has been appointed assistant supervisor of bridges and buildings of the Shenandoah division, with headquarters at Roanoke, Va. He succeeds **Ernest S. Chaffin,** whose promotion to supervisor of bridges and buildings of the Norfolk division was announced in the December issue.

In connection with the leasing of the Wheeling & Lake Erie by the New York, Chicago & St. Louis, as announced elsewhere in these columns, **H. Smith,** formerly general foreman bridges and buildings of the W. & L. E., has been appointed district supervisor of bridges and buildings of the Wheeling & Lake Erie district of the Nickel Plate, with headquarters remaining at Brewster, Ohio.

Special

John P. Scully, division engineer of the Maine Central, has been appointed industrial, real estate and tax agent, with headquarters as before at Portland, Me.

Obituary

William M. Ray, who retired in 1939 as senior assistant engineer of the Baltimore & Ohio at Pittsburgh, Pa., died on November 5 at his home in Wilkinsburg, Pa., at the age of 80.

Association News

Bridge & Building Association

With members in attendance from as distant points as Houston, Tex., Dover, N. H., Richmond, Va., and Berkely, Cal., the Executive committee of the association met in Chicago on December 12. Under the direction of President W. F. Martens, the principal work of the meeting was to assign to specific subject committees the 102 association members who had volunteered for committee work. At the same time, chairmen and vice-chairmen were selected for the respective committees. The Executive committee also reviewed preliminary plans for the 1950 convention, which, as noted in the Meetings and Conventions columns of this issue will be held in Chicago, September 18-20, at the Hotel Stevens, concurrent with the annual meeting of the Roadmasters' Association.

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 18-20, 1950, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 14-16, 1950, Chicago. W. S. Lacher, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual meeting April 25-27, 1950, Rice Hotel, Houston, Tex. H. L. Dawson, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Men's Association—E. C. Gunther, Secretary, 122 S. Michigan Avenue, Chicago 3.

Maintenance of Way Club of Chicago—Next meeting, January 23, 1950. E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Walter L. Turner, Jr., Secretary, 30 Church street, New York.

National Railway Appliance Association—R. B. Fisher, Secretary; Lewis Thomas, assistant, Secretary 59 E. Van Buren street, Chicago 5.

Railway Tie Association—Annual meeting, August 28-30, 1950, Brown Hotel, Louisville, Ky., Roy M. Edmonds, Secretary-treasurer, 610 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 18-20, 1950, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago, 5.

Roadmasters' Association

With a near 100 per cent attendance, the Executive committee of the association met in Chicago on December 5, to make preliminary plans for the 1950 convention and to select the personnel for the various technical committees to make studies during the year. Nearly 200 members of the association volunteered for committee work as a result of the request sent out recently, and from these assignments were made to the various subject committees, and committee chairmen and vice-chairman were selected. These same members suggested a total of 94 subjects for consideration in 1951.

Maintenance of Way Club of Chicago

G. M. Magee, research engineer, Association of American Railroads, was the speaker at the December 19 meeting of the club, and discussed the causes of the wearing and splitting of crossties, and what is currently being done officially and unofficially by railroad men to offset them. The attendance at the meeting was 129.

The next meeting of the club, to be held at the usual place—Eitel's restaurant in the Field building—will be on January 23, will be addressed by C. B. Bronson, maintenance of way assistant to vice-president, New York Central System, who will discuss "How Long Should a Rail Be?" The business session will be preceded by the usual dinner at 6:30 p. m.

Metropolitan Maintenance of Way Club

The annual luncheon meeting of the club—held at the Hotel Shelburne, New York on December 8—was attended by 188 members and guests, thus becoming one of the largest functions ever to be held by this organization.

The feature of the meeting was a paper on Modern Railway Maintenance by Blair Blowers, chief engineer maintenance of way of the Erie, Cleveland, Ohio. Mr. Blowers attended the luncheon, but, because of a throat infection, was unable to address the group, and his paper was read by C. K. Scott, engineer maintenance of way, Erie, Jersey City, N. J.

The next meeting will be held at the Shelburne on Thursday, February 23, at 6:30 p. m. Details of the program will be announced later.

Track Supply Association; B. & B. Supply Men's Association

Plans are being made for a huge products exhibit to be staged jointly by the member companies of these two associations at the Coliseum, Chicago, in September, 1950, during the concurrent annual conventions of the Roadmasters' and Maintenance of Way As-

(Continued on page 72)

Association News (Cont'd)

sociation and the American Railway Bridge & Building Association The exhibit will be open during the entire three days (September 18-20) that the conventions will be in progress. Since there will be no exhibit of the National Railway Appliances Association during the American Railway Engineering Association convention in March, 1950, the exhibit at the Coliseum in September will be the only display during the year of materials, machines and devices used by the track, bridge and building and water service forces of the railroads.

The exhibit is expected to have special significance for a number of additional reasons. It will be the first exhibit of its type to be held since the 40-hr week went into effect for non-operating employees of the railroads. Not only will it be the only exhibit to be held in 1950, but there will not be another such exhibit until 1952. For these reasons, and based in part on the response already received from manufacturers, the officers of the two supply associations anticipate that the display will be of record proportions.

Requests for information on the exhibit should be addressed to Lewis Thomas, director of exhibits, 59 E. Van Buren street, Chicago 5.

American Railway Engineering Association

Nominations for the annual election of officers of the association have been announced. In line with the usual practice the election will be held by letter ballot. The nominations are as follows:

President, G. L. Sitton, assistant chief engineer, Southern System, Washington, D. C.; vice-president, T. A. Blair, chief engineer system, Atchison, Topeka & Santa Fe, Chicago; directors (four to be elected), R. P Hart, chief engineer, Missouri Pacific, St. Louis, Mo.; R. W. Seniff, engineer of tests, Baltimore & Ohio, Baltimore, Md.; W. J. Hedley, assistant chief engineer, Wabash, St. Louis, Mo.; G. M. O'Rourke, assistant engineer maintenance of way, Illinois Central, Chicago; C. B. Porter, assistant chief engineer – construction, Chesapeake & Ohio, Richmond, Va.; Clark Hungerford, president, St. Louis-San Francisco, Springfield, Mo.; A. N. Laird, chief engineer, Grand Trunk Western, Detroit, Mich.; and E. J. Brown, engineer of track, Burlington Lines, Chicago.

For members of the Nominating committee (five to be elected); L. L. Adams, assistant chief engineer, Louisville & Nashville, Louisville, Ky.; E. E. Oviatt, chief engineer, New York, New Haven & Hartford, New Haven, Conn.; H. Austill, chief engineer, Terminal Railroad Association of St Louis, St. Louis, Mo.; Barton Wheelwright, chief engineer operation, Canadian National, Montreal, Que.; W. E. Heimerdinger, engineer bridges, Chicago, Rock Island & Pacific, Chicago; M. H. Dick, managing editor, ***Railway Engineering and Maintenance;*** engineering editor, Railway Age, Chicago; J. E. Bernhardt, engineer structures, Chicago & Eastern Illinois, Danville, Ill.; J. E. Fanning, assistant to chief engineer, Illinois Central, Chicago; W. E. Cornell engineer of track, New York, Chicago & St. Louis, Cleveland, Ohio; Ray McBrian, engineer standards and research, Denver & Rio Grande Western, Denver, Colo.

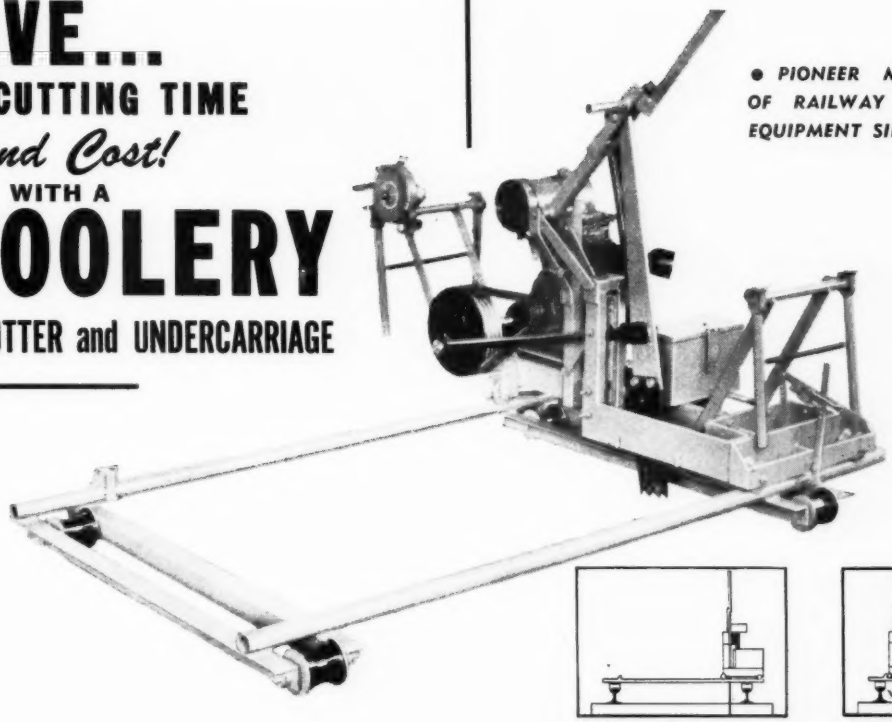
In addition to the above names to be balloted on H. S. Loeffler, assistant chief engineer, Great Northern, St. Paul, Minn., will automatically be advanced from junior vice-president to senior vice-president.

Only two committees have scheduled meetings for January. The Committee on Masonry will meet at the Hotel Gibson, Cincinnati, Ohio, on January 24 and 25, and the Committee on Economics of Railway Location and Operation will meet at Chicago on January 18. A committee meeting scheduled for early February is one to be held by the Committee on Wood Bridges and Trestles. The committee will meet at New Orleans, La., on February 9, and on February 10 it will visit large saw mills at Alexandria, La., in an inspection trip sponsored by the Southern Pine Association.

The December bulletin (484), containing eight committee reports, was mailed

(Continued on page 74)

SAVE...
TIE CUTTING TIME *and Cost!* WITH A WOOLERY TIE CUTTER and UNDERCARRIAGE



• PIONEER MANUFACTURERS OF RAILWAY MAINTENANCE EQUIPMENT SINCE 1917

FIG. 1—tie cut at one end inside rail with Woolery tie cutter.

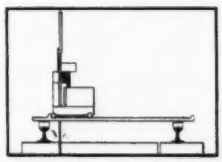


FIG. 2—Tie Cutter moved across on undercarriage for second cut on other end of same tie . . . without lifting or turning.

CUT MORE TIES PER DAY... AT LOWER COST!

In these days of heavy high speed rail traffic, need for continuous replacement is a necessity.

With a WOOLERY Tie Cutter and Undercarriage, one man can cut tie into three sections without turning machine . . . Permits fast easy removal of old tie without disturbing ballast . . . gives new tie a firm safe bed to rest on. Entire cutting operation requires less than one minute . . . allows operator to remain just ahead of removal gang. Close cooperation in crew results in more work done per day at lower cost per tie.

MAKE A COMPARISON—see how you can reduce tie replacing costs with a WOOLERY Tie Cutter and make your maintenance dollar go farther.

WRITE FOR COMPLETE INFORMATION NOW !

WOOLERY PB-S WEED BURNER
Three burner model . . . Burns 15 ft. swath 1 trip, 25 ft. second. Enclosed cab.

WOOLERY PB-B WEED BURNER
Three burner type, trailer mounted. Burns 15 ft. swath 1 trip. Burns all types weeds.

WOOLERY MACHINE COMPANY
MINNEAPOLIS MINNESOTA
Pioneer Manufacturers of RAILWAY MAINTENANCE EQUIPMENT
RAILWAY WEED BURNERS • MOTOR CARS • FLANGEWAY CLEANERS • TIE CUTTERS • TIE PLATE SPACERS • RAIL JOINT OILERS • CREOSOTE SPRAYERS
EXCLUSIVE EXPORT REPRESENTATIVES: PRESSED STEEL CAR COMPANY, INC., PITTSBURGH, PENN.

to members right after Christmas. This bulletin contains the reports of the Committees on Ties, Buildings, Wood Preservation, Economics of Railway Labor, Maintenance of Way Work Equipment, Clearances, Waterproofing, and Impact and Bridge Stresses.

The January bulletin (485) is to be mailed shortly after January 15. This bulletin will contain the reports of the Committees on Wood Preservation, Masonry, Records and Accounts, and Iron and Steel Structures.

Supply Trade News

General

The **Hyster Company**, Portland, Ore., has appointed the following new industrial truck distributors to handle sales and service of fork-lift trucks, straddle trucks, mobile cranes, and their attachment: **A. & W. Engineering Company,** 2222 N. W. 14th street, Miami, Fla., to cover 17 counties in southern Florida; **Wrenn Brothers,** 220 South College street, Charlotte, N. C. to cover all South Carolina, southern North Carolina, and most of Georgia; and the **King & Kringel Machinery Corp.,** 2390 S. Delaware, Denver, Colo., to cover Colorado, most of Wyoming, and western Nebraska.

Personal

Robert D. Hill has been elected treasurer of the **Taylor-Wharton Iron & Steel Co.** and **J. G. Kreis** has been appointed vice-president—purchases.

The **Worthington Pump & Machinery Corp.,** Harrison, N. J., has announced the appointment of **A. M. Shaw** as assistant manager of the Pump and Compressor Merchandising division.

Champ Carry, president of the **Pullman-Standard Car Manufacturing Company,** Chicago, has been elected also president and chief executive officer of **Pullman, Inc.,** effective January 1, succeeding **David A. Crawford,** who is retiring.

Milton A. Karp has been appointed chief engineer of the **Luria Engineering Corporation,** in charge of the engineering department, which is being moved to the company's plant in Bethlehem, Pa. Mr. Karp was formerly chief engineer for Ellis Wing Taylor.

Douglas H. Pittman, general supervisor in the maintenance of way department in the Southeast for the **Oxweld Railroad Service Company,** a unit of **Union Carbide & Carbon Corp.,** has been appointed southeastern representative. He succeeds the late **John L. Hoffman,** whose death is reported elsewhere in this issue.

John S. Vreeland, sales representative for all of the transportation papers of Simmons-Boardman Publishing Corporation, including *Railway Engineering and Maintenance*, with headquarters at New York, and formerly eastern

John S. Vreeland

editor of this magazine, has been promoted to business manager of Railway Signaling and Communications, a Simmons-Boardman publication, succeeding **Frederick C. Koch** who died recently, as reported in the November issue.

Mr. Vreeland was born on November 16, 1907, at Cincinnati, Iowa, and received his higher education at Iowa State College, Ames, Iowa, from which he was graduated in 1928 with the degree of Bachelor of Science. In 1928, Mr. Vreeland was appointed a rodman on the Rock Island with headquarters at Cedar Rapids, Iowa. He was later promoted to instrumentman, and worked on the Iowa division and on the construction and location of the Coburn-Birmingham line, with headquarters at Polo, Mo. In June, 1933, Mr. Vreeland was appointed a supervisor of track, which position he held successively on the Oklahoma division at Booneville, Ark., on the Iowa division at Des Moines, Iowa, and on the Missouri-Kansas division with headquarters at Eldon, Mo. In May 1938, he became associate editor of *Railway Engineering and Maintenance* at Chicago. In October, 1944, he was transferred to New York as eastern editor, and in July, 1946, was appointed advertising salesman in the same office.

The **Weir Kilby Corporation** has made the following appointments: **Ralph F. Gordon,** vice-president—sales; **M. J. Hassan,** vice-president—engineering; **J. G. Kreis,** vice-president—purchases; **E. H. Schubert,** vice-president—operations; and **Ralph G. Detmer,** assistant to president, sales and engineering.

(Please turn to page 76)

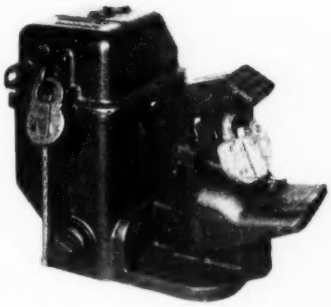
YOU CAN SIMPLIFY SWITCH INSTALLATION AND MAINTENANCE

WITH
- **G-R-S MODEL 9 HAND-OPERATED SWITCH MACHINES**
- **G-R-S MODEL 10 ELECTRIC LOCKS**
- **G-R-S ROLLER BEARINGS**
- **G-R-S HINGED FRONT RODS**

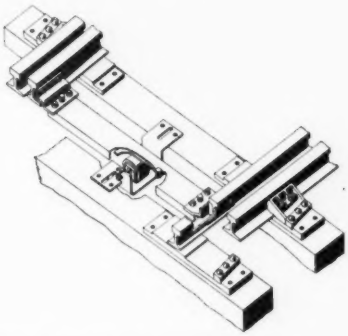
G-R-S MODEL 9 HAND-OPERATED SWITCH MACHINE enables you to centralize, in a single device, every facility that may be required at a hand switch.

The basic Model 9 machine is a hand-throw stand with built-in lock rod. Any of these facilities may be added—*each becoming a built-in part:* target or lamp staff, electric lock, normal circuit controller, reverse circuit controller.

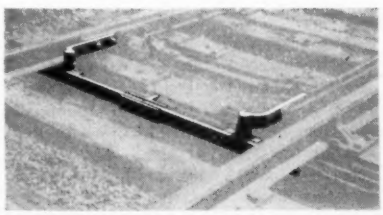
With electric lock, but without lamp staff, the Model 9 stands 13½ inches above tie level. Fits any switch with a throw up to 6 inches. Mounts on two ties on 20- to 24-inch centers. No framing needed. For more details, ask your G-R-S district office for Bulletin 182 and Handbook 32.



G-R-S MODEL 10 ELECTRIC SWITCH LOCK locks the hand-throw lever of the Model 9 switch machine as shown above. It also fits practically any ground-throw stand. This lock is rugged, weatherproof, and simple to install. Requires only two lag screws. Ask for Bulletin 183.



G-R-S ROLLER BEARING lets your switches *roll* instead of dragging on the riser plates. Install with no rail drilling. Replaces a switch rod. Ask for Folder 122.



G-R-S HINGED FRONT ROD practically eliminates switch point roll and spring. It gives you an easy working switch and reduces maintenance. Installation is same as for any front rod. Ask for Folder 134.

GENERAL RAILWAY SIGNAL COMPANY

New York 17 Chicago 3 ROCHESTER 2, N.Y. St. Louis 1 A-2413

Supply Trade News (Cont'd)

Kenneth I. Thompson, eastern sales manager, of the **Oxweld Railroad Service Company**, a unit of **Union Carbide & Carbon Corp.**, has been promoted

Kenneth I. Thompson

to general sales manager, effective January 1. Mr. Thompson was born in Bridgeport, Conn., in 1905. After graduating from Staunton Military Academy, Staunton, Va., he started his business career with the Pennsylvania Pump & Compressor Co., as a salesman. He was later connected with the Fuller Lehigh Company. Before joining Oxweld in 1945, he was with Ingersoll-Rand Company for a number of years; his last position was western manager of the railroad department.

The **Cullen-Friestedt Company** has appointed **W. D. Hoffman** and **R. M. Johnson** of the Railway Track-Work Company, assisted by **W. C. Bamber**, as sales representatives in the northeastern states. Sales headquarters for that territory will be at 3207 Kensington ave., Philadelphia 34, Pa.

Stephen C. May has been appointed vice-president and general sales manager of **Blackmer Pump Company**, Grand Rapids, Mich. Mr. May formerly served as consulting sales counselor with the Auto-Soler Company, in sales executive capacities with the Pacific Manufacturing Corporation and the Iron Fireman Manufacturing Company, and as vice-president and sales manager of Darling Valve & Manufacturing Co.

A. M. McLaren has been appointed branch manager for **Fairbanks, Morse & Co.**, at Los Angeles, Cal., succeeding **J. A. Cuneo**, who has been appointed manager of the company's branch serving the Chicago area. Mr. Cuneo succeeds **John S. King**, who has been transferred to Cincinnati, Ohio, as branch manager, replacing **J. S. Peterson**. Mr. Peterson will be attached to the sales manager's office in Chicago, working on special assignments in connection with the company's scale division. **William H. Kingsley**, district manager of the New York office of the Ideal Electric & Manufacturing Company,

has joined Fairbanks, Morse as manager of the Electrical division, with headquarters at Chicago.

Robert C. Hood, vice-president of the **Ansul Chemical Company,** Marinette, Wisc., has been elected president, succeeding his late brother, **F. James Hood,** whose death was reported in the December issue. **Leonard C. McKesson,** formerly sales director, has been advanced to vice-president in charge of sales, and **Arthur C. Pope,** formerly production manager of the company's sulfur dioxide and methyl chloride plants, has been promoted to vice-president in charge of manufacturing.

J. H. Berryman has been appointed assistant to the manager of the technical sales division of the **Air Reduction Sales Company.** Mr. Berryman will be responsible for the technical promotion and sales of equipment for the recently introduced Aircomatic Welding Process. He was graduated from John Hopkins university in 1935 with a degree in mechanical engineering. He joined the Bethlehem Steel Company at Sparrows Point, Md., and remained with that company as assistant lubrication engineer until 1940 when he entered the army as a second lieutenant. Emerging from the service in 1946 with the rank of lieutenant-colonel, Signal Corps, Mr. Berryman joined the Air Reduction Sales Company in that year and served in the technical sales division as machine welding specialist and assistant metallurgical engineer until his recent promotion.

Herbert W. Chamberlain, vice-president of the **General Railway Signal Company,** at Rochester, N. Y., has been appointed executive vice-president, with the same headquarters, effective January 1. **Arthur E. Heimbach,** western manager at Chicago, has been appointed vice-president at Rochester, and will be in charge of sales in the western United States and Canada. Appointed vice-president in charge of sales in the eastern United States and Canada is **Percy W. Smith,** eastern manager, with headquarters at New York. **Oscar S. Field,** director of engineering and research, with headquarters at Rochester, has been advanced to vice-president of engineering. **Carl D. A. Henze,** resident manager of the Chicago office, has been appointed western manager, with the same headquarters, and is succeeded by **Eugene F. Auth,** sales engineer of the Chicago office **Sidney W. Freeman,** sales engineer of the New York office, has been appointed resident manager of the same office.

Paul L. McCulloch, Jr., has been appointed sales manager in the Pittsburgh (Pa.) sales office of the **American Manganese Steel** and **Electro-Alloys Divisions** of the **American Brake Shoe Company.** He replaces **M. A. Zeller** who has resigned.

(Please turn to page 78)

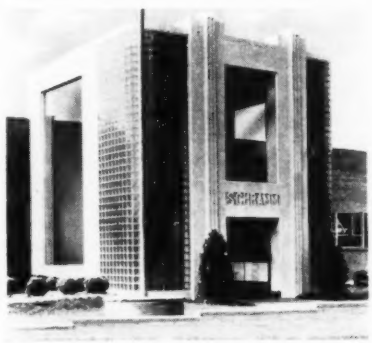
Supply Trade News (Cont'd)

John H. Trent, vice-president in charge of transportation sales of the **Johns-Manville Sales Corporation,** has retired under the company retirement plan.

R. B. Fisher, vice-president in charge of the Railroad and Industrial department of the **Buda Company,** Harvey, Ill., has retired. Mr. Fisher entered the service of this company in 1910 as assistant engineer, and served successively thereafter as chief engineer, assistant to the president, general sales manager and vice-president and director. Mr. Fisher will continue to serve as a member of the board of directors.

Howard H. Pruneau, sales engineer at Missoula, Mont., for the **Worthington Pump & Machinery Corp.,** has been promoted to construction equipment regional supervisor for the mid-west territory with headquarters at Chicago, succeeding **H. J. Schultz,** who has resigned.

R. L. Van Alstyne has been appointed manager of all scale factories for **Fairbanks, Morse & Co.,** Chicago, with headquarters at East Moline, Ill. Mr. Van Alstyne's duties will include the administration and research departments, as well as the supervision of the scale factories at both St. Johnsbury, Vt., and East Moline. Mr. Van Alstyne



SCHRAMM, INC., CELEBRATES GOLDEN ANNIVERSARY—This is the main entrance of the plant at West Chester, Pa., of Schramm, Inc., which company is celebrating its fiftieth anniversary this year. The company was established on January 2, 1900, and for a time its place of business was a small machine shop at Philadelphia, Pa. It now occupies a large modern factory covering an area of 17 acres. Established by Chris D. Schramm, the company was first engaged in servicing and selling gas engines. In 1908 the company brought out a portable engine-driven air compressor, featuring the interchangeability of parts. In 1917, when it became necessary to acquire larger factory facilities, the business became established at West Chester.

has been engaged in manufacturing activities with Fairbanks, Morse & Co., for about 29 years, serving in various production and executive capacities in their plants at East Moline, Pomona, Cal. and Beloit, Wis.

Obituary

J. A. Schallenberg, assistant comptroller of the **Worthington Pump & Machinery Corp.,** Harrison, N. J., died on December 16, after a long illness.

John L. Hoffman, Southeastern representative for the **Oxweld Railroad Service Company,** a unit of **Union Carbide & Carbon Corp.,** died suddenly on October 15, after 27 years of service with the company.

Trade Publications

(To obtain copies of any of the publications mentioned in this column, use postcards, page 19)

Abrasive Rolled-Steel Floor Plate—The Alan Wood Steel Company has published an eight-page booklet presenting the applications, specifications and advantages of Algrip, a steel floor plate in which abrasive grain, the same type as used in grinding wheels, is rolled as an integral part of its upper portion.

Fabco Tie Pads—Fabreeka Products Company, Inc., has issued an eight-page booklet on the use of Fabco tie pads to prevent mechanical wear of ties, thereby extending tie life and reducing expenditures for tie renewals, re-gaging, lining and surfacing. The booklet also discusses the special benefits of Fabco tie pads for switch ties, bridge ties, and ties on curves and in station tracks.

The Masterplate "Iron-Clad" Concrete Floor—The Master Builders Company has issued a 36-page booklet on the Masterplate Floor with its iron-armored surface that prolongs floor life. The booklet discusses the spark resistant, static-disseminating, non-dusting, corrosion-resistant and economical feature of the material, and presents a variety of pictures showing Masterplate floor in service.

Nordberg Machines for Ballast Reconditioning—The Nordberg Manufacturing Company has issued a bulletin, designated as No 174, describing its three-machine team for the reconditioning of ballast. The first of these machines is the Cribex, which, at a rate of 80 to 130 cribs per hour, removes material from cribs and deposits it beyond the tie ends. The second machine is the Ballastex, which, at a rate of 800 to 1600 ft. per hr., excavates ballast between tracks or on the shoulder, and either wastes it to one side or feeds it to the third machine of the team, the Screenex. The Screenex screens the fouled ballast, wastes the dirt beyond the shoulder and returns the clean ballast to the track in any desired proportion.

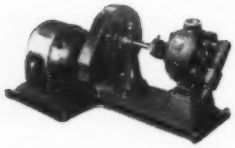


Fig. 12
FUEL OIL TRANSFER PUMP

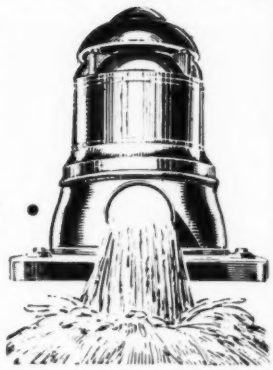
For smooth, efficient handling of all types of clean liquids, there is a Viking pump built in the size and style to meet your needs. Viking pumps are especially built for bearing lubrication, fuel oil transfer and cooling water service. Ask for free bulletin 2201Y.

VIKING
AN HONORED NAME IN PUMPING

See Our Catalog in SWEETS

Viking PUMP COMPANY
Cedar Falls, Iowa

LOWER COST OPERATION
Longer Life



Layne well water systems are designed and built to produce much greater volumes of water than can be obtained from the conventional type of installation. Skillful designing and precision manufacture of the Layne Vertical Turbine pump used in these systems give extra high efficiency. The results are: more water—less cost and longer life for the unit. Furthermore, Layne well water systems are so ruggedly built that upkeep cost is almost nothing.

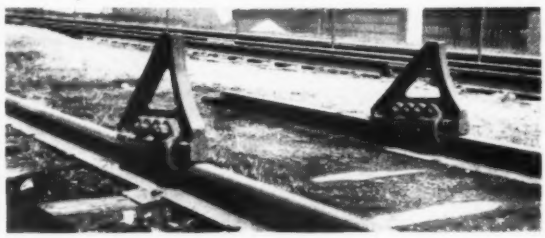
Thousands are now serving cities and industries throughout the world.

For further information on Layne Well Water Systems—or Layne Vertical Turbine Pumps, catalogs, etc., address

LAYNE & BOWLER, INC.
General Offices
Memphis 8, Tenn.

LAYNE
WELL WATER SYSTEMS

SAVE TRACK SPACE with Q & C CAR STOPS



Q & C Car Stops are economical because they require very little track space and a minimum of labor for application. They wedge firmly to the rails. No drilling is necessary. One size is suitable for all sections of rail used in yards and side tracks.

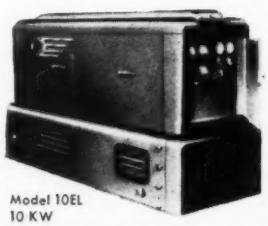
Order now for early delivery

Q and C **THE Q and C CO.**

Chicago 5 New York 6 St. Louis 1

INSURE SIGNAL SYSTEMS
AGAINST INTERRUPTION

with ONAN ELECTRIC PLANTS



Model 10EL
10 KW

● ONAN Standby Electric Plants guard the signal systems of great railroads everywhere. When electrical power is interrupted for any reason, they start automatically or by remote push-button switch. Proved by thousands of standby installations to give dependable service even under continuous heavy-duty operation. A.C. and D.C. models, 350 to 35,000 watts.

D. W. ONAN & SONS INC.
4569 Royalston Ave., Minneapolis 5, Minn.

Write today for folder.

Onan PRODUCTS **STANDBY POWER**

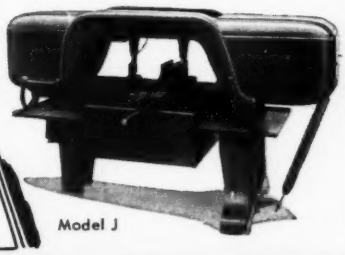
Greater CAPACITY!

That's what you need—greater metal cut-off capacity—to help increase production, a big advantage of the

JOHNSON MODEL J BAND SAW

It cuts 10" rounds, 18" flats. It's sturdy, fast, has extra rigidity that permits higher speed operation and extra accuracy. To decrease your cost of cut-off work, insist on a Johnson Band Saw.

Also a smaller, speedy, lighter Portable MODEL B Saw, with all the accuracy of the larger model. Capacity 5" rounds, 10" flats.



Model J

Write for CATALOG!

JOHNSON MANUFACTURING CORP.
ALBION, MICHIGAN

SEALTITE FASTENERS

Double-Life
SEALED-TITE IN ZINC

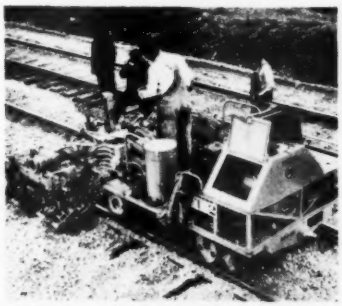
All Sealtite products are offered in our thick, double-life, hot dipped galvanized finish. As the name implies, the service life of the bolt is lengthened saving replacement costs and assuring freedom from fastener corrosion. Actual experience tests prove the economy of using Double-Life Sealtite Products.

LEWIS BOLT & NUT CO., 504 Malcolm Ave. S.E., Minneapolis

Designed and Engineered
FOR RAILWAY USE

Everywhere on the MAIN LINES

One man in one minute super-tamps and finishes up to 80 sq. ft., of surface with this Wisconsin-powered Wayer Impactor.



This Wisconsin-powered Jackson Multiple Tamper carries 12 tampers and finishes track in one operation.

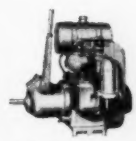
WISCONSIN HEAVY-DUTY *Air-Cooled* ENGINES... KEEP JOBS ON SCHEDULE

Wherever track gangs are working, the chances are you'll find one or more pieces of equipment powered by Wisconsin Air-Cooled Engines . . . because these are the most generally accepted and specified engines in the 2 to 30 hp. field among builders of universally used railway maintenance equipment.

Wisconsin Engines rate top preference both by equipment manufacturers and track gangs because these engines can be counted on for steady-going dependability under the most rugged operating conditions . . . regardless of climate, season or weather. You get properly balanced cooling from sub-zero to 140° F., through high volumetric flywheel-fan air distribution. A weather-sealed, rotary type high tension outside magneto, equipped with impulse coupling, gets the engine away to fast starts and keeps it turning smoothly and steadily. Tapered roller bearings at *both* ends of the drop-forged crankshaft (on *all* sizes of engines) handle all thrust loads, providing fullest protection against bearing failures.

And with a torque curve peaking at relatively low r.p.m., Wisconsin Engines have plenty of "give and take" horsepower margin for the hard pulls without stalling. In addition to which these engines are extremely compact and light in weight for easy portability and handling.

In other words, by specifying "Wisconsin-powered equipment", you have the best assurance of keeping maintenance jobs moving on schedule.

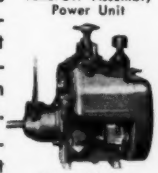


2 to 6 hp. Models, Clutch Assembly

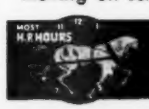
7½ hp. Standard

6 to 9 hp., Clutch Reduction Assembly

7 to 13 hp., Clutch Take-Off Assembly Power Unit



15 to 25 hp., Clutch Assembly



WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

ALPHABETICAL INDEX TO ADVERTISERS, JANUARY, 1950

A

Allis-Chalmers Tractor Division 23
American Hoist and Derrick Company 26
Armco Drainage & Metal Products, Inc. 18

B

Barco Manufacturing Co. 30
Beall Tool Division, Hubbard & Co. 24
Bethlehem Steel Company 3
Browning Crane & Shovel Co., The 69

C

Caterpillar Tractor Co. 7
Chicago Pneumatic Tool Company 28
Cullen-Friestedt Co. 74

D

Dow Chemical Company, The 9
Duff-Norton Manufacturing Co., The 76

E

Eaton Manufacturing Company 2
Electric Tamper & Equipment Co. 14

F

Fabreeka Products Company, Inc. 12
Fairmont Railway Motors, Inc. 34

G

General Railway Signal Company 75

H

Hubbard and Company 24-71

I

Industrial Brownhoist Corporation 21
International Harvester Company 13

J

Johns-Manville 8
Johnson Manufacturing Corp. 81

L

Layne & Bowler, Inc. 80
Lewis Bolt & Nut Co. 81

M

Michigan Power Shovel Company 72

N

National Lock Washer Company, The 83
Nordberg Mfg. Co. 27
Northwest Engineering Co. 5

O

Onan & Sons Inc., D. W. 80
Oxweld Railroad Service Company, The 15

P

P. & M. Co., The 1
Pacific Coast Borax Co. 77
Power Ballaster Division 10-11
Pullman-Standard Car Manufacturing Company 10-11

Q

Q and C Co., The 80

R

Railroad Accessories Corporation 33
Rails Company, The 22
Railway Track-work Co. 24
Rinshed Mason Co. 16-17

S

St. Paul Division, Gar Wood Industries, Inc. 31
Schramm Inc. 78
Simmons-Boardman Publishing Corporation 82

T

Taylor-Colquitt Co. 6
Templeton, Kenly and Company 79
Texas Company, The 4
Thew Shovel Co., The 29
Timken Roller Bearing Company, The 25
True Temper Corporation 36

U

Union Carbide and Carbon Corporation 15

V

Viking Pump Company 80

W

Wisconsin Motor Corporation 81
Wood Industries, Inc., Gar 31
Woodings Forge & Tool Co. 67
Woolery Machine Company 73
Worthington Pump and Machinery Corporation 84

This $1,000,000 line relocation is an outstanding example of the skill and foresight of railroad engineering and management.

The same wise foresight is shown even when expenditures are relatively moderate. Along thousands of miles of well-laid track Improved Hipowers are chosen because they are exceptionally efficient and economical.

They help maintain track—by absorbing shocks and stresses, by equalizing bolt tensions, by insuring resilient joints, and by protecting rail ends.

IMPROVED HIPOWERS

IMPROVE TRACK

NORTHERN RAILWAY PHOTO

THE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS

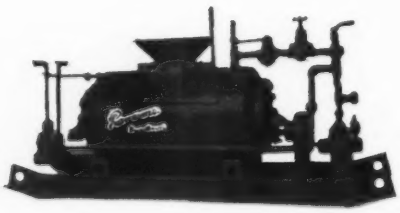
YOU'RE PAYING TOO MUCH FOR MAINTENANCE IF YOU'VE MISSED ANY OF THESE BLUE BRUTES!

More Concrete For Less Money

You get longer service life and faster, better mixing with Blue Brute Portable Concrete Mixers. Performance records prove that features like these pay off: high carbon, Timken-equipped drum rollers . . . smooth, positive, gear-and-pinion drive . . . and Ransome's famous mixing action.

High Speed Surfacing With These Team-Mates

Hook up four of these Blue Brute Tampers to a Hand-I-Air Compressor and watch them hang up records for speed and economy. Constant, economical air supply, feeding precision-made, easy handling tampers will cut your costs.



No "Softies" on the BLUE BRUTE Track Team

Why go to needless expense ballasting and surfacing the same soft spots in your roadbed year after year? Blue Brute Grouters will firm up soft spots and eliminate mud pockets — put a lasting foundation under track quickly and economically.

Hour After Hour of Steady Operation

Here's a rugged performer — the Blue Brute Centrifugal Pump — that will stand up under long hours of steady use and come back for more. Its fast, dependable pick-up with plenty of reserve power will keep your pumping costs at rock bottom. Built in A.G.C. sizes to A.G.C. standards.

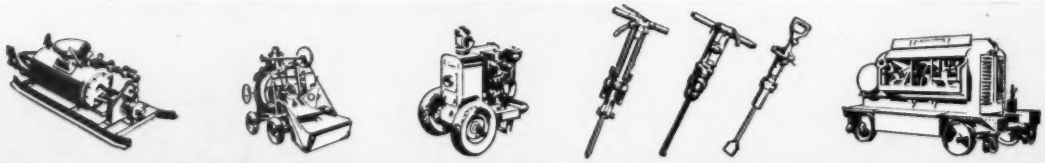
Railroad men all over the country will tell you that these and the many other Blue Brutes are cutting costs on the widest variety of maintenance jobs. Write for complete information on how their money-saving performance proves *there's more worth in a Blue Brute.*

BUY BLUE BRUTES

Worthington Pump and Machinery Corporation, Worthington Construction Equipment Dept., Harrison, N. J.
Distributors in all principal cities

WORTHINGTON

HD-8



FOR EVERY CONSTRUCTION AND MAINTENANCE JOB